

S I N C L A I R

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QL WORLD

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The QL GOLD CLUB

More special offers for
old and new members



SuperBasic

Three dimensional graphs

Hands on the Thor

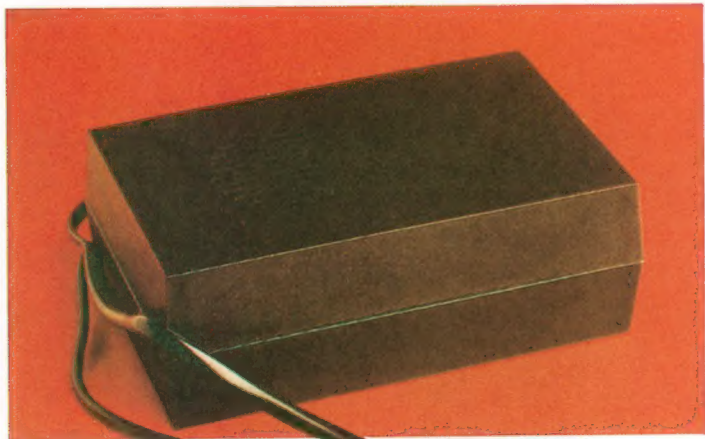
A day in the life
of a QL user

New this month

QL First Form

Meet the mysteries
of computing

Introducing **QTALK** TEXT TO SPEECH IN A FLASH



PRICE	
Qtalk	£75.00
VAT	£11.25
Post/Packaging	£ 2.25
Total	£88.50

Qtalk Applications

- 1) **Health**
 - a viable solution to speech impairment/impediment
 - allows the blind to write documents and programs
- 2) **Education**
 - an excellent tool for teaching the relationship between the written and the spoken word
 - a valuable aid to those assisting the dyslexic or for students with reading problems
 - an amazing new method for teaching or learning the translation of one language to another
 - touch typing made easy with keyboard echo
- 3) **Industry**
 - enables verbal output of readings/warnings from independent peripherals. (BUS, IEEE, RS232 etc)
 - can be used to give instructions to an operator
 - could be set up as an answerphone or entryphone
- 4) **Entertainment**
 - allows the user to verbally list programs while checking them against a hardcopy listing
 - can be made to hum musical tunes
 - provides a whole new dimension to computer games

Hardware Features

RS232C, Selectable baud rate, DCE or DTE

- will operate on any computer with an RS232 port
- at any standard baud rate
- does not tie up the expansion port

Three adjustable presets:

- allows adjustment of Volume, Pitch and Pitch range (16 levels)

Black Eurocard enclosure, QL plug, power lead, socket and serial cable

- simply plugs in between your power supply and QL
- maintains the integrity of your computer system

(Note. CST Thor version is powered through the serial lead)

Software Features

Full 68000 Text To Speech software incorporating 16 levels of pitch.

- lightning fast conversion of any string into speech
- any multi syllable word may be split, with different syllables spoken at differing levels of pitch, allowing intonation
- 20K of code. Will work on standard (128K) machine and Thor

Built in Exception Table (BET)

- certain words defy all logic and no amount of rules can cater for these. Therefore, their pronunciation has been permanently set in an exception table. eg 'thorough', 'ghoti', 'Lbytes', 'flp1'

Size selectable User Exception Table (UET)

- Users can set up their own table of any size and fill it with their own words/pronunciations. This overrides words in the built in table therefore allowing translation of languages. This table can be saved and reloaded for later use.

Over 400 rules to convert text to speech.

- If the word or string is not found in either table it will be pronounced via a sophisticated set of rules.

Full Device driver implementation.

- a new device called 'QTK' is added to the QL's list of devices. This means that you can use all of the built in basic keywords to send information to QTALK. eg PRINT, LIST, DIR, COPY etc. and also use QTALK with other computer languages (PASCAL, FORTRAN etc)
- a set of clever superbasic extensions is also included to make QTALK a breeze to use
- may be set to pronounce or ignore punctuation

Multitasking screen editor

- can be called up any time to set up and add, alter or delete words from the User exception table. Comprehensive on screen help.
- Hopefully the last word in QL clocks — talking time and date

Many more thoroughly documented features

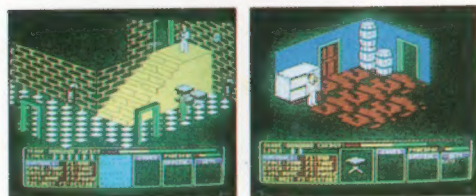
ALIEN HIJACK

The year is 2003 and you are working on the S.P.C. Forward, as ship's engineer. On the 23rd day you are attacked by an alien space ship and all hell breaks loose. You must regain control of your ship, against some mighty tough opposition.

The first TALKING game for the Sinclair QL. Possibly the most amazing QL graphics seen to date

- 3D graphics
- Full 68000 code
- 192 colour screens
- fast, dynamic, challenging
- talking hero and aliens

Note. Alien Hijack does not require QTALK to run but it certainly makes it a lot more fun. Works on a 128K QL.



PRICE	
Alien Hijack	£15.00
VAT	£ 2.25
Post/Packaging	£ 1.00
Total	£18.25

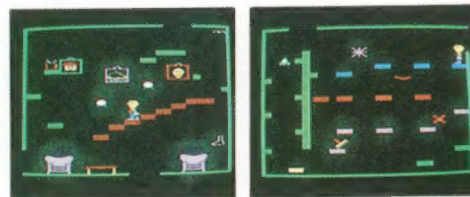
PUZZLE MANIA

Your mission, should you decide to accept, is to journey about the danger ridden cells of Maniaville to retrieve the lost loot of Lawless Lenny. Several obstacles will attempt to thwart your progress and only the smartest gamer will survive.

The second TALKING game for the Sinclair QL

- full 68000 code — 40 colour screens — fast, arcade action
- spoken clues to help you win (if you are good enough)
- Truly addictive challenge

Note. Puzzle Mania can operate without QTALK but is much more fun with it.



PRICE	
Puzzle Mania	£10.00
VAT	£ 1.50
Post/Packaging	£ 1.00
Total	£12.50

Special Introductory Offer

Buy QTALK, PUZZLE MANIA and ALIEN HIJACK and receive £5.00 discount pre VAT total

Name _____ SQLW 4

Address _____

Please rush me _____

for my **QL/THOR** (cross out one which does not apply)
with software on 3½" **disc/mdv** (cross out one which does not apply)

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Card number

Expiry date _____ Signature _____

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Please allow up to 21 days for delivery (airmail).

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(New Zealand)

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or
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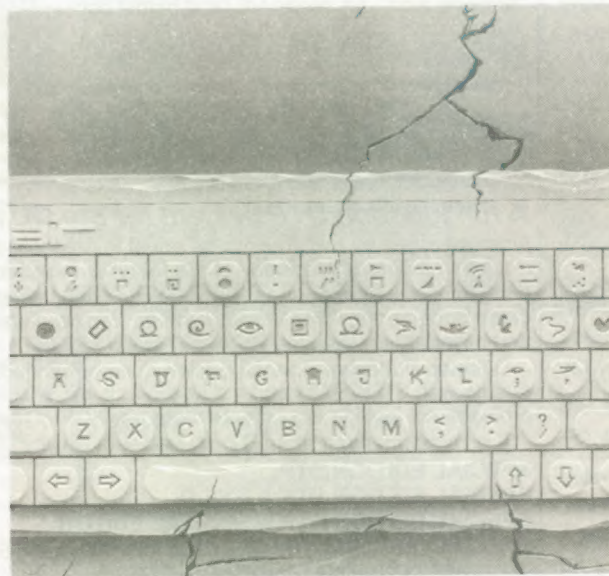
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NEXT MONTH

COMPETITION

Win a colour monitor designed specially to complement the QL in this simple contest.

QTALK SPEAKS

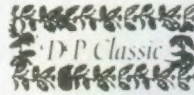
Ron Massey converses with the Maxtronics speech synthesiser

TURBO V2.0

Turbo V2.0 is the very latest version of Digital Precision's acknowledged world-beating compiler. SuperBasic programs compiled with Turbo can run 100 times faster! Ever since its release just over a year ago Turbo has astounded the pundits and amazed its users not just by its speed, but by its incredible flexibility and, in combination with the Turbo Toolkit, its vast array of powerful commands.

Turbo v2.0 has a totally reworked front-end user interface, allowing a huge number of compile options and - amazingly - a setting for how good a programmer you are! User configurable in advance and at runtime. Helpful error messages supplement the 350 page user encyclopaedia. Features smart auto-correction - Turbo is tolerant!

Turbo Toolkit now provides 200 additional commands, procedures and functions to increase the power of Superbasic, nearly all of which are available under the interpreter and Turbo. Turbo Toolkit is RAM-based and can be used as a stand alone utility or to complement existing toolkits such as Supertoolkit - it costs £29.95 by itself. For a full feature - list see our ad in the January '88 issue of QL World.



Turbo V2.0 system including Turbo Toolkit £99.95.

Strict deadline! Upgrades for Supercharge (send everything) to Turbo system will be available for £70 up to 10 April - and for £80 thereafter.

SUPERCHARGE SPECIAL EDITION

An exciting and definitive release of the first and most famous SuperBASIC compiler, with all the features of standard Supercharge plus:

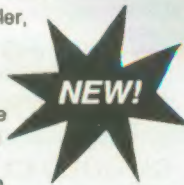
- ★ **FASTER RUNNING CODE** - Up to 65% of Turbo's speed!
- ★ **NO LENSLOK!!** Tremendous ease of use...

Supercharge Special Edition is priced at an absurdly low £29.95. There is no more reason to hold back - here is the product you always wanted, and it is improved in performance, with non-budget features at a budget price.

Guidance notes from DP: The ultimate SuperBASIC compiler will always be Turbo, whose range of features, flexibility and speed make it state-of-the-art.

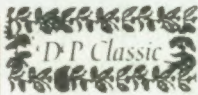
But, if either:
 a) You cannot afford Turbo
 or
 b) You want a taster before investing in Turbo
 then Special Edition Supercharge is ideal.

Standard Supercharge owners - send us your cartridge and a £20 upgrade fee.



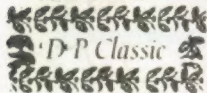
STUNNING HALF PRICE - JUST £29.95

THE EDITOR



"Superb...it exceeds feature specifications found even in the best word processors"

Sinclair QL World.



At last a word processor

for the QL with truly professional facilities. The Editor is a word, text, character and file processing system of very superior capabilities. With 200 commands, very high speed and great flexibility, The

Existing users - upgrade to Special Edition Editor for only £25

Editor handles text files, Quill files, programs in SuperBasic and other languages, data files, screens, object files etc. Editor natively multitasks. A comprehensive configurator gives you total control over fonts, system defaults, colours, cursor speed, sizes...For a full feature list see QL World Dec. '87 issue.

The Editor V1.17, which works on any QL,

EDITOR V1.17 £29.95
SPECIAL EDITOR V2.05 £49.95

comes with a comprehensive 90 page book. The Special Edition Editor V2.05 requires a minimum 128K extra RAM, has 40% more commands and a new 160 page manual. It's the last word.

EYE-Q

The definitive QL graphics/CAD system

Eye-Q is the definitive graphics package for the QL.

Eye-Q is a program which will enable you to make the most of your artistic/design talents via an unequalled array of features and "drawing aids", an intelligent (and highly consistent) user interface with pop-up menus. In Eye-Q, the same keys do the same things

whichever option is selected: anything that can be done to the whole screen can be done to any part of it.

Eye-Q is 100% handwritten machine code: this gives it unsurpassed smoothness.

With fully comprehensive A4 manual.

£29.95

DESKTOP PUBLISHER

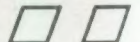
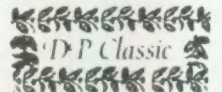
A full function DTP system for the QL with 256K RAM expansion.

Acknowledged by the press to be equal to anything available on a home micro, Desktop Publisher incorporates many of the features found on professional DTP systems costing many thousands of pounds. Desktop Publisher will give you the power to produce sophisticated documents; it will tackle anything from leaflets and posters to brochures, catalogues and newsletters. Desktop Publisher costs £59.95.

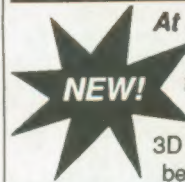
Desktop Publisher Special Edition is an enhanced, more powerful version for QL configurations with 512K RAM and a disk drive. It will enable the ambitious user to create more professional looking documents more easily. Full feature list in QL World Dec. '87 issue.

It is recommended that DTP is used with quality WP and graphics software.

SPECIAL EDITION DTP £79.95
SPECIAL EDITION DTP & EYE-Q £104.95
SPECIAL EDITION DTP & SPECIAL EDITOR £114.95
SPECIAL EDITION DTP, SPECIAL EDITOR & EYE-Q £139.95
 DEDUCT £20 FOR STANDARD DTP



3D PRECISION



At last, a 3D modelling and CAD graphics package that truly does justice to the QL's potential.

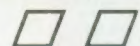
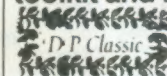
3D CAD on the QL has always been either too slow or too crude to be of any practical value - until 3D Precision. 3D Precision is a full featured, menu driven 3D designer and toolkit which enables you to easily produce professional looking 3D designs and drawings: there is no requirement for uniform cross sections and no restrictions on minimum step size.

3D PRECISION permits continuous, pre-programmed and co-ordinate based drawing with pan, scroll and rotate about any axis, all at astounding speed. Functions include recolour, rescale, recentre, zoom, edit, stretch and reposition. Perspective is continuously adjustable by zooming, translation and rotation of the 'camera'. Fully rubber banded autogeometrics are provided.

3D PRECISION comes with an easy to use toolkit which adds 100+ commands to SuperBasic and machine code. It's fast enough for animation, and gives you all the effects and controls you've dreamed of.

3D PRECISION provides advanced users with facilities for artistic/technical modelling, conceptualisation and manipulation in 3D. Needs at least 256K ram expansion.

3D Precision complete with toolkit and manual - only £49.95



MICROBRIDGE

Microbridge is a superb contract bridge bidding and playing program which can also teach bidding in a series of sixteen lessons used in conjunction with a brilliant manual.

The tutor is followed up with a virtually unlimited set of hands for further practice in bidding and play. Lots of fun.

Microbridge is one of the strongest bridge programs available for any computer. It understands many of the subtle elements of card play and never cheats by peeping at hidden hands. This makes it a challenge for skilled players as well as a non-abusive instructor for beginners. Microbridge's fluent commentary is a first in computing. **Microbridge needs 256K RAM expansion and costs £34.95** "Ten out of ten" - QL World

SUPER SPRITE GENERATOR

The ultimate tool for the creation of high quality high speed sprites, whether for fast action/adventure games or serious applications. Now the truly professional tricks of the top games programmers can be recreated with no machine code knowledge required on your part.

- 100% flicker free
- real time collision detection
- comprehensive diagnostics with error trapping
- Up to 256 multicoloured sprites and planes
- 16 frame animation

"The results that can be achieved are simply excellent" is what QL User said way back in 1985. Now with many more new enhancements.

£29.95 complete

£5 off if V4.0 is bought with something else.

SUPER MEDIA MANAGER

Frustration with corrupted data? Never want the experience? SMM provides everything you are ever likely to need in one integrated menu-driven package - and it's not just for when things go wrong.

- Copy any (yes, ANY) disk or cartridge
- Sector loading, copying and editing.
- Auto file recovery ● Directory sort
- String searching ● Hardware diagnostics
- Direct file copying from other disk for mats i.e. PC-DOS, MS-DOS, Acorn DFS.
- Text file translation utility.

"The definitive blockbuster... includes every possible facility"

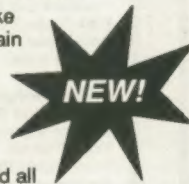
ONLY £39.95

Cartridge only version £24.95

SUCCESS - The Supreme CP/M Code Emulation System

Now with automatic CP/M-type disc recognition system!

- CP/M is the most widely implemented operating system. Famous programs like Wordstar, Supercalc, dBase and Perfect Writer, and a huge library of public domain software, is available to run under CP/M on disk (either size).
- QL owners can break into this program bank using Success. Success stands for Supreme CP/M Code Emulation System. No knowledge of CP/M is required.
- Success goes further than CP/M emulation - it replicates the Z80 chip!
- Success is much more than just a CP/M emulator. It has full QDOS file handling, ED line editor, 8080 assembler, PIP copier, creation of executable CP/M and all the CP/M utilities. What distinguishes Success is its absolutely phenomenal speed.
- Success is designed for beginners, but the manual also contains detailed guidance for those who want to access CP/M and QDOS at machine code level. The extensive manual contains full details of where you can get cheap CP/M programs. Open up your QL to the enormous potential of CP/M NOW.



Nothing succeeds like Success - only £49.95

DIGITAL C

Digital C is both the best and the fastest C compiler available for the QL. Highly trans-portable: exceeds the Small C specification. The QDOS library gives the most complete degree of QL compatibility.

Digital C generates machine independent, compact, stand-alone, multitasking executable machine code. The supplied library manager and generator allows integration of C functions into library modules for later use. Ideal for a beginner, sufficiently sophisticated and advanced for a pro. *Digital C can be used with Quill: to get the very best out of it, use it with Editor (either version).*

£39.95 Complete with manual

RESS..STOP PRESS..STOP PR

Need guidance? Call/write for our new REVIEW DIGEST: a collection of independent critical press reviews. 52 page product brochure also available. Both free. Both different. **Prize draw.** £2,500 worth of prizes must be won! **Bargain basement.** Disk i/f £65, ICE £20 (£30 with cholCE), GigaBASIC £12, 3 channel sound board slashed from £80 to £40 (only a few left)! **Inside QDOS.** The full 260 page ROM dis. Send your QL's serial no. and £29.95, quick. **Transfer utility.** Converts any unprotected cartridge program to run from disk: you need Tebby's toolkit (almost certainly in your disk i/ROM). £10. **Hardware.** Our brochure contains details. **ANNOUNCEMENT.** Due to popular demand, DP extends its prize draw deadline to 31 May 1988: to enter, call for our brochure. Enter as many times as you want. **Laserprinter Bureau Service.** Send us your DTP document (A4) disk, we will laserprint it. £7 per page. No proofing/corrections undertaken.

BETTER BASIC V2.0 £24.95

Just that - a program that will improve all your programs. Analyses, corrects, and annotates Superbasic Programs. The program is totally user configurable and very easy to use.

"Excellent, a five star program" Sinclair User

SUPERFORTH V2.0 £39.95

The full multitasking, stand-alone, high speed Forth 83 system is supplied with an extremely powerful compiled Othello (which beat the 1983 World champion). Now with extended 100 page manual and full string handling. Fully compatible with 68000 code and QDOS.

ULTRAPRINT V2.0 £19.95

Soup up your Epson/Okii compatible printer. 22 different type sizes and styles, giving you control over all aspects of text and graphic output. Easy to use, fast, multitasking and fully compatible with Eye-Q. Supplied with manual written for idiots.

DISKS FOR CARTRIDGES

Send us your working new/used microcartridges and we will send you brand new blank disks. One 5.25" for 2 cartridges, one 3.5" for 4. Minimum quantity 12 cartridges. A super deal!

PROFESSIONAL ASTROLOGER

The most advanced, accurate and extensive astrology package yet produced for any home micro. Professional Astrologer is suitable for those with advanced astrological knowledge, but can be used equally well by curious amateurs.

The program offers the most complete readout possible including ten pages of personality/character delineation, six pages of day-to-day and year-to-year personalised text predictions and three pages of 'synastry' text comparisons between two people. These are just some of the astrological features offered:

- Transits ● Progressions ● Seven house systems ● Individually adjustable orbs ● 158 birth data files ● Eclipses ● Closing aspect indicator

Professional Astrologer can be supplied with its complementary program; Professional Astronomer. This program features a full planetarium display, automatic parallax correction, planet faces and solar system display in parallel projection. Astronomer on its own costs £29.95.

"One of a kind...every requirement provided for...descriptions like superb, ultimate, excellent are hardly adequate" QL World

Professional Astrologer £59.95

With Astronomer £69.95

Super Astrologer (elementary) £24.95

GAMES

BLOCKLANDS - fast addictive maze game with super-smooth multi-directional scrolling. £9.95

DROIDZONE - The all time classic space shoot 'em up - astounding speeds. £9.95

SUPER ARCADIA - Two games for the price of one! BMX burner is a 64 screen arcade adventure, + Grid Racer for only £9.95

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SUPER BACKGAMMON - fast response, clocks, 3 play modes. Complete with rules. £12.95

Any 3 for £24, any 4 for £30, all five for £36!

To: Digital Precision, 222 The Avenue, London E4 9SE

or Telephone 01-527 5493

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DIGITAL PRECISION

COMPUTERS

QL JS 2.3 software	£169
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Psion 2.35 sets	£23
(inc 2.38 Archive)	

PSION ORGANISER

Organiser XP 32K	£138
128K Datapak	£100
32K D Rampack	£55
Harvester Superchip	£99
Data Organiser	£35

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128K Rampack	£50.00
QL - Z88 link	£23.00
Centronics interface	£30.00

Z 88

TK

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the QL stockist

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Sandy Megaboard +20Mb HD phone	
Dual D/D 3.5 in drive	£209.00
Dual D/D 3.5 in. & i/face	£295.00
Dual 3.5 in. & 512K SQB	£350.00
Cumana disc interface	£ 86.25
768K Trump Card	£199.00

SPARES

JS ROM sets	£27.50
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ULA ZX 8301	£9.50
ULA ZX 8302	£10.25
MAB 8049	£7.50
CPU 68008	£25.80
M/drive assemblies- complete	£27.50
Voltage regulator (high output)	£4.75
Power supply UK	£23.50
Power supply European	£25.50
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SUNDRIES

10 Microdrive cartridges	£17.50
Cartridge storage box	£5.50
QL Dustcover	£5.00
100 Microdrive labels	£3.75
Powerclean filter	£36.00
Eprom Programmer	£129.00
Battery c/bck kits	£19.50
10 DS/DD discs 3.5" (brand)	£29.00
Joystick + adaptor	£16.00
512K internal U/G	£94.00
Centronics Interface	£29.00

SOFTWARE

BUSINESS

Flashback (c-d)	£25.00
Cash Trader (PDQL)	£80.00
Cash Trader + Analyser	£105.00
Decision Maker	£35.00
Entrepreneur	£35.00
Finance Manager	£19.00
Home Finance (Buzz)	£22.00
Investment Monitor	£20.00
Project Planner	£29.00
Small Traders Pack	£25.00
Spellbound (c-d)	£30.00
Spellbound + Filebound	£35.00
Touch Typist	£12.00
Pacioli	£25.00
QTYPE	£30.00

UTILITIES

Archivist	£30.00
Cartridge Doctor	£13.00
Expert System	£30.00
CPM Emulator (c-d)	£45.00
Assembly Lang. Toolkit	£25.00
Page Designer 2	£35.00
Desktop Publisher - S/Edition (d)	£80.00
Front Page (c-d)	£23.00
Front Page Extra 2 (c-d)	£40.00
ArchRTM	£20.00
ICE Eprom	£27.00
Paste Art	£20.00
Key Define	£10.00
Locksmith	£11.50
Mailfile (256K)	£20.00
PCB Designer 1	£99.00
QFLASH Ramdisk + toolkit	£19.00
QFLASH Ram Eprom	£25.00
QFLASH Ram utilities (c-d)	£10.00
Reconfigurable toolkit 2	£29.00
4 Matter	£11.50
Recover	£20.00
Sideways	£20.00
Sidewinder Deluxe	£20.00
Archive Tutor	£21.00
Super Media Manager (d)	£40.00

XRef	£15.00
Grafix	£16.00
Super Toolkit 2 (Eprom)	£29.00
QIMI + Giga Mouse	£70.00
QLiberator (c-d)	£60.00
QLiberator (budget)	£30.00
QLoad & Rel	£10.00
Success	£50.00
ORam (c-d)	£30.00
RPM	£15.00
Task Master (c-d)	£25.00
Speed Screen	£20.00
The Editor	£29.00
The Editor - special edition	£49.00
Turbo (c-d)	£99.00
Turbo Quill (c-d)	£10.00
Turbo Quill + (c-d)	£13.00
Ultra Print	£20.00
SPY	£15.00

CAD

Concept 3D	£40.00
Eye Q	£29.00
Mandelbrot Magic	£15.00
Technik	£25.00
TechniQL	£50.00
The Designer	£15.00
Viewpoint	£20.00
3-D Designer	£38.00

LANGUAGES

Assembler Workbench	£25.00
Basic-Ally	£20.00
Better Basic	£24.00
BCPL Development Kit	£51.00
C Compiler	£85.00
DevPac Development Kit	£30.00
LISP	£51.00
Digital C	£40.00
MonQL (Eprom)	£30.00
Pascal (Computer One)	£40.00
Pascal (Metacomco)	£75.00
Pro Fortran-77	£92.00

Pro Pascal	£92.00
OMON	£20.00
Super Forth + Reversi	£39.00

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Area Radar Controller	£13.00
Chess	£17.00
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Super Astrologer	£25.00
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Snooker	£13.00
Squadron	£16.00
Super Backgammon 3	£13.00
Strip Poker	£15.00
Type 22	£18.00
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1 Barbarossa	£19.50
War in the East (set)	£39.95
Microbridge	£35.00
Ion Gold	£15.00

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Heart of Gem	£15.50
Horrorday	£15.00
Talisman	£19.00
The Prawn	£15.00

ARCADE

Blocklands	£10.00
Archanoid	£15.00
Death Strike	£15.00
Fictionary	£11.50
Hoverzone	£15.00
Hyperdrive	£13.00
Jungle Eddi	£15.00
Karate	£15.00
Knight Flight	£15.00
Mortville Manor	£15.00
Quboids	£9.00

BOOKS

Using the Psion Organiser	£10	QDOS Companion	£7
Assembly lang. Programming	£9	Inside QDOS	£20
QL Advanced Programming	£15	QL Service manual	£20

Other QL titles available - phone for details -

☆ SPECIALS ☆

GST Macro Assembler + Assembly Lang Book	£39.00
10 DS/DD discs 3.5" unbranded	£12.50

● ALL PRICES INCLUDE VAT AND UK MAINLAND DELIVERY - WE EXPORT WORLDWIDE ●

Phone for details of other QL products OR send SAE for our latest catalogue

Credit card phone orders accepted, or send cheques, postal orders, Eurocheques to:

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NORTH STANFORD, ASHFORD, KENT TN25 6DF**

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QL

S C E N E

Creative Codeworks finds facts faster

Quickfax is the second product from Creative Codeworks, following *Speedscreen*. The program is a data storage system which can be used as a card-file database or as a powerful data source for other programs.

Creative Codeworks

compares *Quickfax* favourably to *Archive*, citing virtually instantaneous searches and fast load and save. The card file function is designed to be easy to use, fast and flexible, with the ability to move, add or delete fields at any time. Fields can be up

to 22 lines long and vary in length according to the information stored to save memory space. Prompts can be added in contrasting user-selectable colours.

Quickfax can send reports to any device, with a choice of layouts, headers and page numbers. Sorting

is in ascending or descending order or by field values. The program runs as an independent task.

For more information or written notification of release, send SAE to Creative Codeworks, PO Box 1095, Birmingham B17 0EJ. Tel: 021 426 5199.

Seven fonts precisely

Main Games has produced a set of seven extra fonts for use with the *Digital Precision Desktop Publisher*, providing up to a dozen new text styles from Olde English to LDC. The package is available on Microdrive or disc for £10 inclusive, from Main Games, 48 Ledgers Road, Slough, Berkshire SL1 2RL. Payment should be made to V. Napolitano.

Main Games is offering £1 each off this package and *Bowled Over* cricket to *QL World* readers.

At one stroke

Cue-well from Rob-Roy Software allows programs to be loaded on the QL with single keystrokes and provides a directory of any device which can be sent to the printer. *Cue-well* can be customised to the user's set-up and has single keystroke operation throughout.

The program costs £5 plus a formatted cartridge from Rob-Roy Software, 94 Teignmouth Road, Clevedon, Avon BS21 6DR.



A plug for mains protection

The Supa 7 mains filter plug from Warwick Products, rated at 7 amps, is designed to prevent voltage spikes and RF interference

reaching computer equipment via the mains. The plug costs £14.95 exclusive of VAT, plus 50 pence postage and packing.

Further information from Warwick Products, 50 Marsh Wall, West India Dock, London E14 9ZJ. Tel: 01 538 2535.

OPEN CHANNEL

Open Channel is where you have the opportunity to voice your opinions in *Sinclair QL World*. Whether you want to ask for help with a technical problem, provide somebody

with the answer, or just sound off about something which bothers you, write to: Open Channel, Sinclair QL World, Greencoat House, Francis Street, London SW1P 1DG.

Archives on record

I would like to draw attention to a serious mistake in the December *QL World* in the Psion Selection article by Simon Goodwin. Apart from the error, the article was very interesting and worthwhile. The last half-page is devoted to Archive, Archdev and Archive RTM. The author states: "There is no way beyond the 64K barrier, so the figures in the table show the maximum number of records you can manipulate with QL Archive."

The statement is untrue. The 64K barrier does not relate to Archive but to each database file. I have Archivist which uses Archive RTM 2.38 with 18,312 records running in multi-file mode. According to the table referred to, I should be able to access only 4,600 — one order field.

The maximum number of records which QL Archive 2.38 can handle at any time is dependent on both the index limit and the number of files it can have open.

The author states: "If you outgrow those sizes — in the table — you will need to upgrade to an IBM clone

and run the MS-DOS versions of Xchange." Perhaps he would like to revise the statement in the light of the foregoing information.

Earlier in the article he states: "Archive was the only program which continued in development after version 2.35. This was almost entirely due to the persistence of Chas Dillon." While acknowledging Dillon's contribution in this area, I know of several other individuals and companies, including my own, who equally badgered Psion into fixing the indexing bugs.

**Richard Howe,
Ark Distribution,
Ventnor, PO38 2LA.**

Archive users desperate to have plenty of data on-line can split records of identical format between several files, as Richard Howe suggested, but I would not recommend it. Archive commands work on a file rather than a group of files. Ability to manipulate data is restricted severely if you split what is logically one file between several files on tape or disc.

For instance, Archive commands to search, insert data in sequence, or to sort records, work with only one file at a time. You could switch manually between files or write a program to do that but it is difficult to keep things in order, in every sense. Even the normal commands for moving back and forth through your data must be re-written if you need an easy way to browse through several files.

With a good deal of effort and plenty of time to spare you can program around these problems. In practice,

I do not think a database package should require people with large files to scramble their data deliberately.

The Archive manual claims that a file can contain up to 65,535 records and that is incorrect. My table pointed out the real limit on the number of records in any file.

It is difficult to know exactly who pestered Psion into fixing the bugs in Archive. I dare say Howe played a part. A senior Psion employee told me that Chas Dillon was the main force behind the corrections to Archive and Psion gave his firm, PDQL, the rights to distribute Archive version 2.38, so I stand by what I wrote. Will others wishing to take credit for Psion corrections please form an orderly queue — in single file, of course.

**Simon Goodwin,
Warley,
West Midlands.**

Editor's notebook

FROM tiny acorns great oaks grow. What has this to do with the QL? Well, if you locate any piece of new — or newly-acquired — computer equipment, you will find somebody nearby who is going quietly nuts. This is an immutable law of the universe. It has happened — and will happen — to all of us at some time or another.

People who are new to computers suffer most — and since the QL is attracting new users all the time, we have started at the bottom this month in the first instalment of *QL First Form* with the question: What is a computer?

Let us get that straight first . . .

Also this month, the QL Gold Club is back with a new game, new utility software which can be built into a routine library, and new special offers. See pages 24 and 25.

Last but not least this month, we have Paul Walton and *Technical Helpline*. Next month — next month — look for our competition.

Self expression

I shall be getting around to reading your AI series soon but I have a hint which I hope is not mistaken for nitpicking. To do an SGN in a single expression, use:

```
DEFineFuNction SGN(x)  
RETurn (x > 0)  
END DEFine
```

I did not write this one — I wish I had. It is straight from a book on QL Basic. I thought it might be of use.

**G. R. Bruntlett,
Sunderland.**

QL

S C E N E

More for small traders

S D Microsystems has developed a new package in its *Small Trader* series. The new program, *General Ledger*, can produce regular reports based on all income/outgoing and bank transactions, including a profit and loss statement.

S D Microsystems tells *QL World* that the system is designed to be easy for non-accountants to use, featuring automatic double entry with cash/bank balance adjustment, auto-sort by date option, many user-definable headings, and user-definable accounting period. Auto-calculation of VAT is an optional feature.

Year end/to date results can be produced by importing individual file totals.

General Ledger can be used for simple cash trading, or run with the *Small Trader Pack* and *Invoicer*.

The program is available on Microdrive for the QL or 3in. disc for the CPC, priced £19.95 plus £2 p&p payable on overseas order. S D Microsystems, PO Box 24, Hitchin, Herts. Tel: 0462 675106.

Stop Press. *Schon Keyboards* believe it has an answer for users of its keyboards who experience key bounce. Contact *Schon* for more information.

Message from GAP

Peter Chambers of GAP Software has asked *QL World* to pass apologies to his customers for recent delays in dealing with orders and queries. The recent illness and death of his father-in-law have prevented him keeping up-to-date with business.

Palantir dips further into the Inkwell

Inkwell Deluxe 2.8 from Palantir Products is the updated version of *Inkwell* for the QL. New features include change of print style by altering the default settings without returning to a word processor, obtaining a Directory from within the program to show file sizes, printouts in

regular, double and quad height, print widths variable from regular width to more than eight times that, and operation with any Epson-compatible printer, including single-density bit-image mode machines.

Palantir also has a new lower price for *Inkwell*. The

first edition cost £16. The new improved edition costs £12 inclusive — £1 p&p on overseas orders. Holders of the older version can upgrade by sending £4 plus their old cartridges.

Palantir Products, 78 Leighton Road, Bedminster, Bristol BS3 1NU.

The brains in Spain



Qlave, the Spanish QL user group, has now been established for two years and has a membership of more than 200. "With a few more members we would be able to produce more software," says a representative. The December issue of its stapled magazine has 64 pages in Spanish, including articles on Forth, QL/Macintosh code, chess playing, equations and a

QLib review, along with local groups, news and letters.

The club runs its own software library of more than 70 programs written by members or in the public domain.

Membership is 4,000 pesetas per annum — more than £20 — and enquiries should be addressed to *Qlave*, PO Box 403, 50080 Zaragoza, Spain.

A Spy in the files

Ark Distribution has announced *The Spy*, a powerful multi-file screen editor to read, investigate and write any type of file from binary to text. Written entirely in assembler, *The Spy* occupies less than 20K and is designed to execute as a multi-tasking function in less than five seconds from disc. It needs no secondary or extension files and can be used under front-ends such as the *GRAM* utilities.

The main feature is

multi-file capability, allowing fast file switching and block transfer between and within files. There are three levels of status line information, fast keypress response and economical memory management. The program can be used to edit itself to customise most of the functions to the user's requirements.

Projected applications include fast program development in most languages, creation and modification of documents and a

schedule of up to 32,767 columns and modem control code files for communications. It can also modify exec files maintaining executable flag and data status and for Microdrive-to-disc conversion in exec and data files.

The package costs £14.95 (U.K.), £16.95 (Europe) or £18.95 (rest of world), from Ark Distribution, Corve Farmhouse, Chale Green, Ventnor, Isle of Wight PO38 2LA. Tel: 0983 79496.



CAMBRIDGE SYSTEMS TECHNOLOGY

24 Green Street, Stevenage, Herts SG1 3DS
Telephone: Stevenage (0438) 352150



INTRODUCING THE CST

16 Bit Performance

THOR XVI

The all new CST Thor XVI is a sign of CST's commitment to developing and expanding the QL compatible marketplace and in particular the unique architecture of the operating system. Together with a full 16 bit bus implementation, David Oliver and his team have gone back to fundamentals to build into the new generation of computers a refined, streamlined Qdos compatible operating systems: Argos.

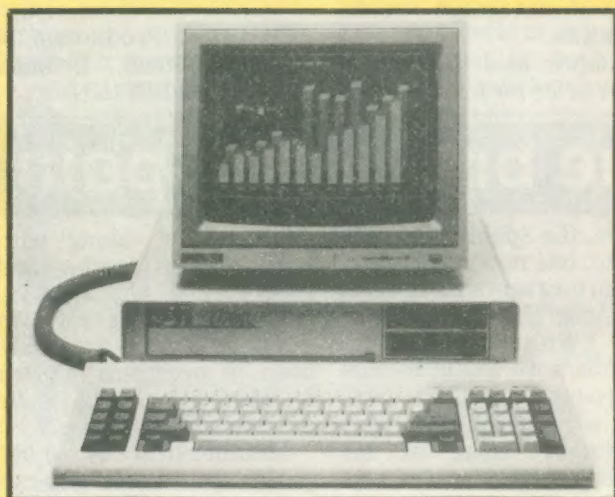
While fully compatible with Qdos and the QL, the Thor XVI has enhanced networking, single key multitasking, up to 6.5 Mb of dynamic ram and all delivered at the very least at twice the speed of the QL. For the professional user there are now 20MB and 40Mb hard discs complemented by a choice of either single or dual 3.5" floppy disc drives.

For our overseas customers (and for not a few foreign language students in the UK), the keyboard layout may be selected dynamically along with national error messages and character sets for more esoteric languages such as Greek and Russian.

CST THOR XVI — ORDER NOW!

Because of the huge initial demand for Thor XVI's (see "Dansoft" article "opposite"), delivery times have reached between 4 and 6 weeks. To ensure delivery, CST are now taking advance orders: CST will give an expected delivery date on receipt of order, if the date is acceptable, the order may be cancelled. Orders will be processed on a strictly first come, first served basis from date of receipt or order.

Orders should be accompanied with cheque or credit card number in the usual way, but these will not be cashed until the goods are ready to ship (cheques will be banked 7 days before shipment to allow clearance).



Please supply:-

	UK inc VAT	Overseas
Qdisc Interface 4 (3.5in. util disc)	£79.95	£72.70
Qdisc Interface 4 (5.25in. util. disc)	£79.95	£72.80
OEP-III Eprom programmer (QL/THOR)	£129.95	£116.00
RAM-plus 512K QL memory	£139.95	£125.20
CST Dual 3.5in. cased floppy discs	£219.95	£200.40
CST Q-488 GPIB instrument interface	£224.25	£198.40
CST QDISC SCSI interface	£230.00	£203.40
Qdisc 4 + dual 3.5in drives	£275.00	£249.40
Qdisc 4, RAM-plus + dual 3.5in. discs	£405.00	£363.60
QL SPEEDSCREEN 3.5" <input type="checkbox"/> 5.25" <input type="checkbox"/> mdv <input type="checkbox"/>	£20.00	£18.00

The Thor XVI Range

	UK inc VAT	Overseas
Thor XVI CF (Workstation)	£690.00	£650.00
Thor XVI IF (Single Floppy)	£805.00	£750.00
Thor XVI FF (Dual Floppy)	£920.00	£850.00
Thor XVI W20F (20Mb Winchester, 1 Floppy)	£1610.00	£1450.00
Thor XVI W20FF (20Mb Winchester, 2 Floppies)	£1725.00	£1550.00
Thor XVI W40F (40Mb Winchester, 1 Floppy)	£2300.00	£2050.00
Thor XVI W40FF (40Mb Winchester, 2 Floppies)	£2415.00	£2150.00
Additional RAM for the Thor XVI Range:		
1Mb Board	£230.00	£210.00
2Mb Board	£920.00	£820.00

For the Thor Range:

	UK inc VAT	Overseas
Philips Monitor (Monochrome)	£92.95	£111.40
Philips Monitor (Colour)	£295.00	£300.40
Beige Mouse	£74.75	£72.00
Psion Chess	£24.95	£22.70
INTROM I from Interlogic	£49.45	£44.00
SPEEDSCREEN rom for Thor	£29.90	£27.00
ROM Installation on your Thor	£15.00	
Floppy Discs 3.5", pack of 10	£15.00	£14.00
Additional 12m Service contract (1F&FF)	£85.25	
Additional 12m Service contract (WF)	£115.00	

QL Trade-in against Thor		£5.00
Deduct £70 (UK) £60 (O/S)		£10.00
Export administration		£5.00
Airmail outside Europe		£10.00

Please complete in full

Name

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Prices are inclusive of carriage
CST reserve the right to alter prices and specifications without prior notice



No. 880309

DANSOFT CORNER THE MARKET

With beta-testing successfully completed, Dansoft's Hellmuth Stuvén visited CST to discuss their initial requirements. CST executives were taken aback though, when Stuvén immediately placed an order taking up the whole of the initial production batches!

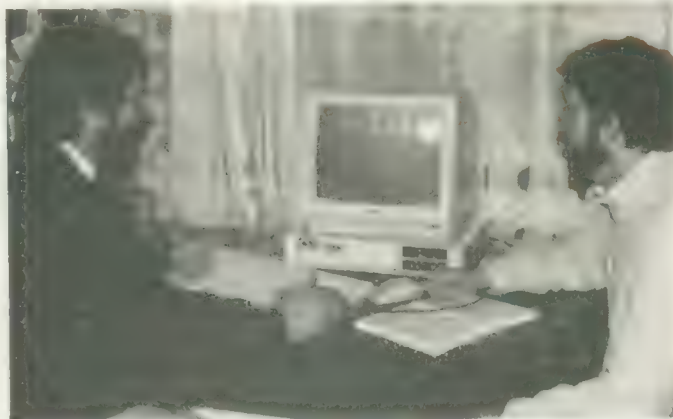
A confident Stuvén said "I am very pleased with the results of the beta-testing; this machine is just what my customers have been waiting for".

CONFIDENT

After many long hours of detailed negotiation a deal was finally struck. With CST not wanting to disappoint the home market a compromise was agreed and machines are to

be allotted to the UK market from the start of May. A system of first come first served will be operated with advance orders.

A CST spokesman said that they appreciate some customers have been let down in the past by other firms and they therefore will not cash cheques or process credit card orders until they are ready to ship.



Stuvén testing the XVI at the home of CST chief Oliver

The current world shortage of some components has been giving the procurers at CST a few headaches too. They are confident, however, that all obstacles can be surmounted. "The

Danish order has created some bottlenecks but with the market bouyant and the order books full it's something we'll have to get used to".

Dear Hilde...

In the past CST have made a point of ensuring not only compatibility but also upgradability within their range. Is it possible to upgrade to an XVI or am I going to be left out on a limb with my FF.

A Hopeful Undergrad

Dear Hopeful

Compatibility's no problem, just boot up and away you go but hang on to your hat! If you want to meet the grade, you will have to change to new hardware. this doesn't mean your stumped though: a nice young man at CST told me that they could do a good deal on a trade in. But why not add an XVI on to your FF — it takes too to network!

Hilde
THOR TIMES
AGONY AUNT

CST PRIZE COMPETITION

WIN A DUAL FLOPPY MACHINE!

This is your chance to win a brand new twin floppy Thor. Just use your skill and judgement to choose the 5 most important reasons for choosing a Thor from the list below. Note the features in order of preference in the boxes provided. In the event of a tie the winner will be the contestant with the most original caption for our picture of Glyn, one of CST's production engineers seen here getting to grips with a tricky piece of hardware. Cut out the form and send to "CST Caption Contest, 24 Green Street, Stevenage, SG1 3DS".

THOR FEATURES

- A. Wide range of compatible models
- B. Xchange business software included
- C. Optional Winchester
- D. Up to 6.5Mb ram
- E. Multi-tasking operating system
- F. 3.5" 720Kb floppy disc drives
- G. 2 serial and 1 parallel port
- H. Networking as standard
- J. QL compatible expansion port
- K. Separate keyboard
- L. Battery backed clock
- M. Dynamically selectable keyboard layout
- N. Single key multitasking
- O. Mouse interface



CAPTION

YOUR CHOICE

1 2 3 4 5

NAME AND ADDRESS

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THOR XVI

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PDQL

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Systems for Businessmen

CASH TRADER UPGRADE version 2.4	
New Users	£85
Existing Users (send CT boot with order)	£44
UPGRADE for CT Upgrades	£10
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SUPPORT SCHEME MEMBERSHIP	
fee per annum	£15
CT ANALYSER (extra memory required)	£25
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SUPPORT SCHEME MEMBERSHIP	
fee per annum	£15
TRADING ACCOUNTS (extra memory required)	
New Users	£125
<i>Special Discounts for Cash Trader Users</i>	
SUPPORT SCHEME MEMBERSHIP fee per annum	£15

Programs for Leisure

DOMINATION	£9
OMEGA (extra memory required)	£14

HARDWARE

All hardware we sell is tested by us before delivery — ask for special terms for TRUMP CARD and NEC drives — 7% PDQL program voucher on hardware purchases. PLUS Unbranded 3.5 discs £20 for 10, Fuji MFDD £32.50 for 10; Fuji MD2DD 5.25 discs £22 for 10. Disc cleaning kits £15. THOR enquiries welcomed.

MANY OTHER General Utility, Archive Utility and Application Systems. NEW Systems or adjustments to existing systems built to order. All PDQL SuperBASIC programs are TURBOcharged. All PDQL built programs are THOR compatible.

Programs for Programmers

ARCHIVE DATABASE ANALYSER	£7
ARCHIVE SCREEN FORMAT PRINTER	£7
PDQ-XREF	£15
SEDIT	£15
SuperBASIC MONITOR	£7

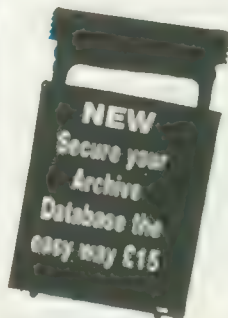
Programs for Everybody

ArchDEV/RTM version 2.38	£20
ARCHIVE TUTORIAL	£21
COMPARE	£10
FLASHBACK	£25
graFix	£16
IMAGE D	£24
LAZARUS	£20
NAMES & ADDRESSES (extra memory required) ..	£18
(with RTM extension)	£36
PSION PRINTER INSTALLER and Configurator enhanced and TURBOcharged	£6
PDQ-COPY	£8
RECOVER	£20
SPECIAL EDITOR latest edition (extra memory required)	£49.95
SECURE	£15
SPEEDSCREEN	£20
SPELLBOUND and FILEBOUND (compiled version) (extra memory required)	£35
FILEBOUND (send disc/cartridge and s.a.e.)	£5
TASKMASTER (extra memory required)	£25
PSION SUITE upgrades	
versions 2.35 Quill, Abacus, Easel and Archive version 2.38 £5 each, send disc/cartridge and s.a.e.	

PDQL

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for home or business use — Order from list or write for current catalogue. Prices include VAT and postage within the UK. Cheques with orders to, and full descriptive list available from, PDQL. Please state details of toolkit, extended memory and/or disc

UPGRADES: The following programs have been UPGRADED on the dates shown; users may UPGRADE their existing versions; send master + £5 - SEDIT (Jan 88); RECOVER PDQ-XREF and COMPARE (July 87); MAILMERGE de LUXE (Dec 87).

TRADING ACCOUNTS

A brand new flexible Accounts package — Cash Trader Data files easily converted — built at the request of Businessmen with extra book-keeping needs.

At least 256k memory required.

All the advantages of Cash Trader Upgrade plus many new features — navigation by initial letter as well as scrolling; varying size Groups a feature; Analyser included with Bank Reconciliation option, daily summary totals and other features designed to speed up both book-keeping and reporting £125

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Upgrade customers	£45
Support Scheme Members	£40
Upgrade customers with CT Analyser	£20
Support Scheme members with CT Analyser	£15

PDQ PAYROLL

Takes the aches out of producing the weekly pay-packets. Pre-printed pay-slips available. Handles all aspects and reports for PAYE purposes £70

Annual Support Scheme £15

COMPARE

Displays in character, HEX or decimal any differences between two supposedly identical files, each sector containing a mismatch shown on screen; reposition by number and magic panel alignment to continue the scan. Program line numbers can be ignored £10

PDQ-XREF - Indispensable

Provides a full glossary of user-defined key words in your SuperBASIC program. Every occurrence listed in alphabetical order with line numbers reference and type of user summary gives warnings of names used but not defined, or defined but not used. Typing errors immediately spotted £15

LAZARUS raises from the dead those text files lost on disc — grieve no more £20

SPEEDSCREEN speeds up your QL, window handling, scrolling, etc, in Psion and other programs £20

SPELLBOUND checks as you type £29.95

FILEBOUND (Turbo'd) checks old documents in;
SPELLBOUND at three words per second (minimum)

Together £35

FILEBOUND on its own £5 — send s.a.e. and blank disc/cartridge with remittance.

THE EDITOR SPECIAL EDITION printer driver included, block-copy by line, character or column, many other improvements £49.95



graFix + SCREEN DUMP

The printer driver you have been waiting for; now you can print from Front Page or Desk Top Publisher on any dot-matrix printer compatible with the QL. Very simple to install. Can rescale your graphics horizontally/vertically and it can print sideways £16

IMAGE D

A brand new three-dimensional drawing system with a difference — moves to any required perspective — displays four perspectives on demand — shaded options — option to combine a number of separate drawings — capable of designing commercial products and domestic items — create own 3D Logo £24

CASH TRADER UPGRADE

The Accounts program built for the small business. It provides a complete and easy-to-enter Accounting Routine with instant up-to-date Balance sheet, Profit & Loss A/C, Audit Trail, VAT Report and VAT Return as well as a Trial Balance.

Accountants use it - nuff said!

For new users	£85
Existing users (send boot cartridge)	£44
Annual Support Scheme	£15

CT 2.4 Upgrade for Upgrade users send master disc/cartridges .. £10
(Support Scheme Members) £5

CT ANALYSER

Compatible with Cash Trader Upgrade — this new module provides the means of producing analyses for management and audit purposes. Needs extra memory £25

FLASHBACK the new data handling system £25

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UTILITY FILE

Ron Massey draws his conclusions on a trio of graphics packages.

Product: Graphic Construction Kit
Price: £19.95
Source: Ultrasoft
Vennhausen Allee 210
4000 Duisburg 12
West Germany

One of the more interesting aspects of the QL is the ease with which graphics programs can be produced for it. If your programming is a little shaky, a number of software houses have produced collections of sub-routines which link graphic procedures and functions into SuperBasic, making it possible to have the best of both worlds — fast machine code coupled to the relative ease of writing in SuperBasic.

One such collection of routines, the Ultrasoft *Graphic Construction Kit*, will enable you to write a sophisticated program for producing graphics screens, possibly even rivalling many of the commercial programs available. Although a few of the extensions in its repertoire and available directly from SuperBasic, you have machine code options of ZOOM from any of four screen quarters to full screen size; REDUCE “shrinks” the screen to quarter size; ROLL rotates a specified area of the screen by pixel di-

mension and position, pan and scroll, with full image wrapping; MIRROR, vertical or horizontal mirroring of either a specified screen area or the entire screen. RANGE is available for setting window sizes in terms of either specified dimensions or with the use of the cursor keys. MONO converts a colour display into monochrome.

A large part of the system is devoted to manipulating memory, enabling whole or specified portions of the screen to be moved to, from and to different areas of screen RAM. Optionally, defined blocks may be deleted from memory or even saved as individual files.

An integral screen compressor reduces file space by about 30 percent, depending on the complexity of the image. If used for compressing images held in RAM, up to 16 channels may be used for storage of compressed images. SET—CUR provides a means of controlling a graphics cursor; PLOT sets a point at the specified position and in the defined colour. If either of those extensions is used with the XPOS and YPOS extensions, the position of the cursor will be printed at a specified screen location.

One unusual feature

included with *Graphic Construction Kit* is that it includes two extensions purporting to convert Spectrum screens to the QL format. As I do not have a Spectrum, I can make no other comment regarding the quality of the conversion.

That Ultrasoft did not include a machine code FILL routine — or, as it is often called, PAINT — to distinguish it from the SuperBasic somewhat flawed FILL in this toolkit in its otherwise excellent range of commands is surprising.

My only real criticism is the presentation of the manual. It is supplied as eight loose 145mm. square sheets — not page numbered, so finding specific information is rather difficult.

The demonstration program supplied is very impressive. Although it is not so fast as, say, *Eye-Q* for many of its functions, considering the controller program is entirely in Basic, its speed is more than acceptable. It would be interesting to see if compiling the controller program would result in an increase in speed.

Product: GraFix
Price: £16
Source: PDQL Unit 1,
Heaton House,
Camden Street,
Birmingham B1 3BZ
Tel: 021 200 2313

Hot off the drawing board, the latest PDQL Chas Dillion release, *GraFix*, is a printer driver program for dumping graphic screens produced with *Front Page Extra* and *Desk Top Publisher* to a dot matrix printer and includes several important differences.

Although supplied

with their own printer drivers, DTP and Extra have the limitation that they are confined to a fixed hard copy size relative to the size and proportion of the page content in the respective programs. Also, with the best will in the world, it has not been possible to cater for all the many possible printers within the structure of the two publisher programs.

If you find you need a driver which will cater for a variety of specialised requirements, *GraFix* could be what you have been waiting for. Observing the presentation convention of other PDQL programs, user response is dialogue-orientated and supplies the program with three categories of information the type of publisher file, *Extra* or *DTP*; the printer to be used; and the scaling, if any, to be used.

The first category needs to know four things — the publisher filename, if a DTP file, the page size using DTP, whether the DTP page is vertical or horizontal and whether the ink and paper are to be inverted. Although intended for use with a printer directly through the more obvious serial or parallel printer ports, *GraFix* will output to any suitable device.

Since the parameters of some printing requirements, such as scaling or inversion, can take up to 20 minutes to process, you may find that sending the output to a file will prove to be faster. That may be particularly pertinent if multiple copies of a single page are required.

One of the most interesting features of *GraFix* is the structure of its printer .dat file. Rather than the usual raw data file, gdriver.dat is a straight text file

which also includes considerable documentation and can be expanded or modified with Quill or any text editor.

Remarks can be included anywhere in the `_dat` file; only lines beginning with ";" serve a functional purpose. Lines beginning with "." serve the same purpose as the SuperBasic "Remark". Individual groups of data pertinent

pressed without selecting a driver, the program is stopped.

The final category of dialogue will tell the program whether to scale the screen image or not. You are first asked if you wish to alter the scale of the image. If you respond with "y", you will be asked to enter the output scaling figures, horizontal and vertical. Since the figures being

DESKTOP PUBLISHER

FRONT PAGE 2

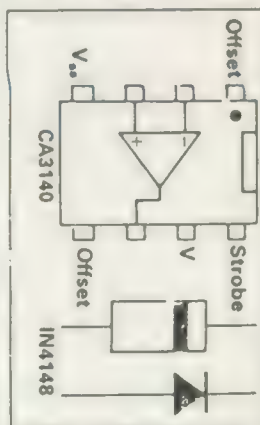
+

graFix

+

any printer

=



to a specific printer are headed by "Name," and the identifying name of the driver.

Following the name of a driver, 12 parameters are used by GraFix to send the correct codes to the printer when dumping a graphic file. Although the majority of printer manuals provide the information needed to build a custom driver for your printer and/or requirements, users with more obscure printers may have to resort to some experiment to achieve a successful printout.

The next stage of printer-related dialogue concerns selection of a specific driver held in the `gdriver_` `dat` file; names are limited to 20 characters and are presented in a menu. Selection of a driver is made by its associated ID number. If the required driver is valid, the message "Selected printer: printer_name" will be displayed. If the driver is either invalid or enter < ENTER > is

entered are for the output scaling, the QL will assume that the x and y dimensions are set in the ratio as one.

If you have selected a horizontal scaling which is wider than the capacity of your printer the hard copy will scale down the horizontal and vertical dimensions automatically.

The only limitation applicable to GraFix I have been able to discover is that it requires memory expansion of the order of 150K, depending on the size of the file to be printed. This limitation is imposed because the entire graphic file has to be held in memory. DTP page files are a fraction less than a 100K in length.

One of the most interesting aspects of GraFix is its inherent flexibility. Provided you are willing to experiment, I would be surprised if it could be defeated by even the most exotic dot matrix printer.

Product: Copymate

Price: £115

Source: TK Computerware, Stone Street
North Street, Ashford, Kent CT20 6DF
Tel: 0303 012801

Touching briefly again on the subject of media security, TK Computerware is supplying a program called *Copymate* which performs a byte-for-byte copy of a master cartridge. In effect, the program makes an attempt to produce an exact copy of the original, not only in terms of the contents of the files on a Microdrive cartridge but also in the sector positions occupied by the files.

When a cartridge is formatted some of the possible sectors are flagged as "bad". In some cases, such sectors are genuinely bad and are never written to but some types of protection routines rely on having specified sectors defined as bad. The odds of formatting a cartridge in the normal way and getting the same sectors bad are extremely high.

Once formatting of the destination cartridge is completed, *Copymate* makes an attempt to duplicate the sector map contained on the source cartridge. If sectors flagged as "bad" are usable, they will be written to. Otherwise, *Copymate* will obtain as close a match as possible.

Considering the complexity of the Microdrive file structure, the *Copymate* success rate is impressive. Even so, a certain amount of luck is needed to obtain a working secondary master and you may have to try several cartridges before you find one suitable.

There are all kinds of arguments, both for and against, regarding the

ethics of making a program like *Copymate* available. Be that as it may, very few software publishers use the sophisticated protection routines developed during the early days of the QL.

Most tend to rely on the honesty of the average user. At most, some programs include coding exceptional to and related to individual purchasers. Unfortunately, however, without programs like *Copymate*, many of the older programs would now be unserviceable.

The master cartridges of programs in constant use, even when working mainly from the mandatory back-ups, are susceptible to the same wear affecting all forms of magnetic media.

My feeling is that publishers have every right to protect an investment which can easily amount to thousands of pounds but not at the expense of the consumer. The type of protection systems evolved in the computer industry have been largely successful because of the mystique surrounding the relationship of hardware and software.

Individuals involved with the wholesale theft of intellectual property do not seem to be concerned unduly with protection systems; many regard cracking protection code and piracy as a game, albeit a destructive one. So, in the end, the argument is really unresolvable. Perhaps the answer lies somewhere in the area of finding other alternatives to the types of protection in vogue.

UTILITY FILE EXTRA

Keeping you informed about the latest developments of QL products reviewed in *QL World*, this edition of Utility File updates reports some interesting improvements to several top-selling products available.

Q Jump has completely re-designed its internal mouse upgrade. First reviewed in the October issue, the new slimline QIMI has been made even more compact by a new printed circuit board and use of miniaturised components throughout. The surface-mounted chips have also been re-positioned to provide security if the PCB is flexed during installation.

Other improvements include longer connecting pins on the bottom of the QIMI PCB, improving the connection of QIMI with the two IC sockets into which it

is located.

Prospective new users of the QIMI mouse interface or those wishing to upgrade existing systems have the option for an additional £10 of obtaining the QIMI with a real-time clock back-up, complete with a re-chargeable nickel-cadmium battery.

Reliability of the battery backed-up clock system is said to be largely dependent not only on the QL ROM version but on the version of 68008 chip as well. Generally, however, reliability of the clock maintaining its set time is reported to be very good.

Palantir has released an upgrade for its *Inkwell* font editor and print utility program. The revised version of this popular program, *Inkwell DeLuxe*, includes two new functions — the baud rate can be changed in the program and users can alter the bit image mode.

The latter feature enables *Inkwell* to work with printers which have only a single-density bit-image

mode and can accommodate quad-density mode on printers having this feature. As with the earlier versions of *Inkwell*, printing defaults to double-density.

Other additions to DeLuxe include a provision for displaying a —lis document on-screen in a close approximation of the way it will appear in its printed form. This feature can save considerable time and expense by eliminating the necessity of printing test runs.

Although provided with the particularly good font editor included with earlier versions of the program, two new fonts have been added to the DeLuxe repertoire.

With never-ending enthusiasm for a very good product, Gap Software has released a new version of *Front Page Extra* which includes a number of revised and some completely new features. Graphic fonts are now supported and Extra is supplied with five types,

with a built-in facility to design additional fonts by amending those included in the sample file or by using the Extra drawing facility. Alternatively, Gap will be releasing new fonts for use with Extra.

Full file-handling facilities are provided to store, save and load any number of fonts and a demonstration file is provided to give users new to the art of font construction an idea of the process involved. The line drawing routine available with keypresses <F3> <F3>, has been completely rewritten and is now faster. Additional drawing options are provided for MOVE, DRAW or WIPE modes. MOVE, incidentally, now no longer erases.

Double-pass printing, superimposing dots over the previous pass of the printer head, now offsets registration slightly on the second pass, improving print quality. Extra is now completely compatible with the Sector *Taskmaster* and the Thor.

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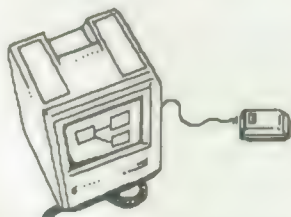
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QL FIRST FORM

In the first of three articles on beginning computing, Mike Lloyd asks the ultimate question: "What is a computer?"

With its impressive power and sophisticated software the Sinclair QL attracts a surprisingly large following among people who would not describe themselves as computer literate. While *Sinclair QL World* strives to cater for all QL users, many articles and even some advertisements assume an understanding of a number of computing concepts and the technical terms used to describe them. Letters we receive suggest that is not so. This short series is designed to introduce the newcomer to the fundamentals of computing concepts, technical terms and jargon.

Computing can be broken into three distinct areas — the physical parts of a computer system, the programs run on a system, and the programming languages in which programs are written. The series is divided in the same way. This month's topic is hardware.

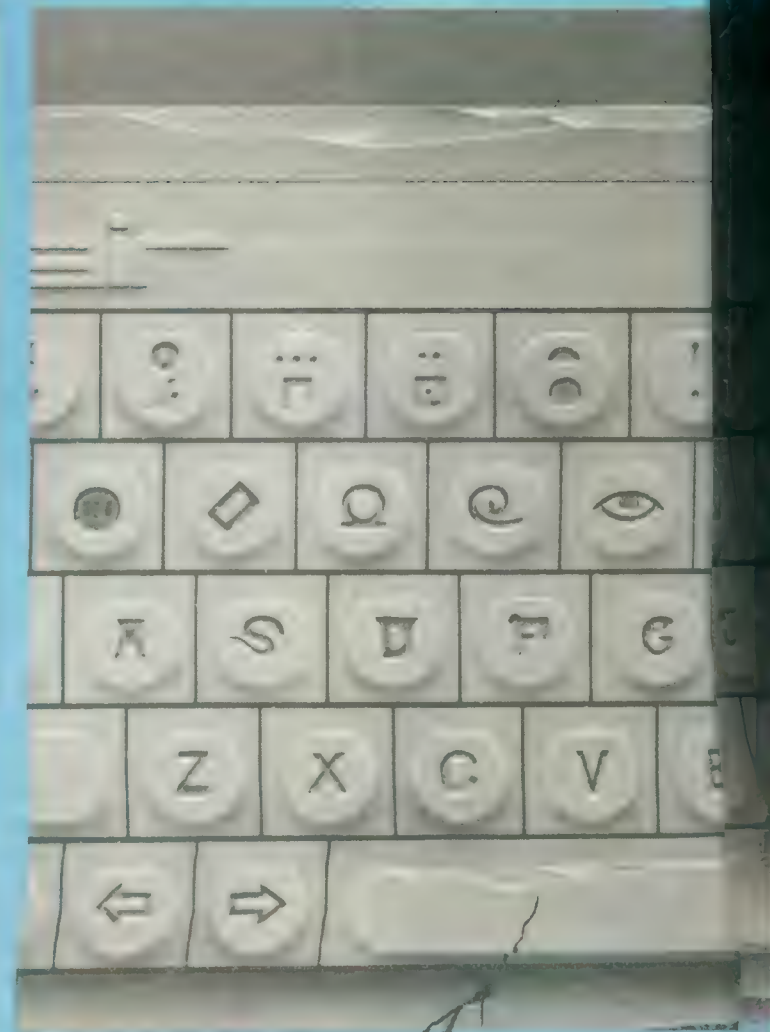
First, what is a computer? That might seem to be a

ridiculously easy question but few computer owners will know the correct answer. Imagine your QL at work. Unplug the screen display. Is what remains still a computer? Of course it is. The screen is just an ancillary device or peripheral to allow you to see the computer output. Unscrew the casing and remove — only in your imagination — the keyboard, the Microdrive mechanisms, the buzzer and the electronics which produce television picture signals. Do the depleted remains of the circuit board constitute a computer?

Surprising

Bearing in mind that what is left is virtually useless by itself, it might be surprising that they do. The components removed are not essential parts of the computer but rather components of a computer system.

A computer has five essential parts. At its heart it must have a *memory store*, an *arithmetic logic unit* and a *control unit*. The memory



store, a series of silicon chips, is divided into two parts. One part stores its contents permanently and although its contents can be read they cannot be altered, this part is known as the *read only memory*. The ROM contains a series of instructions which guide the computer in its dealings with the rest of the system, particularly the handling of the information it receives and disseminates.

This is called *Qdos* and it is an example of an *operating system*. The ROM also contains instructions allowing the computer to interpret and obey commands given by a programmer. These are called collectively *SuperBasic*, a *computer programming language*.

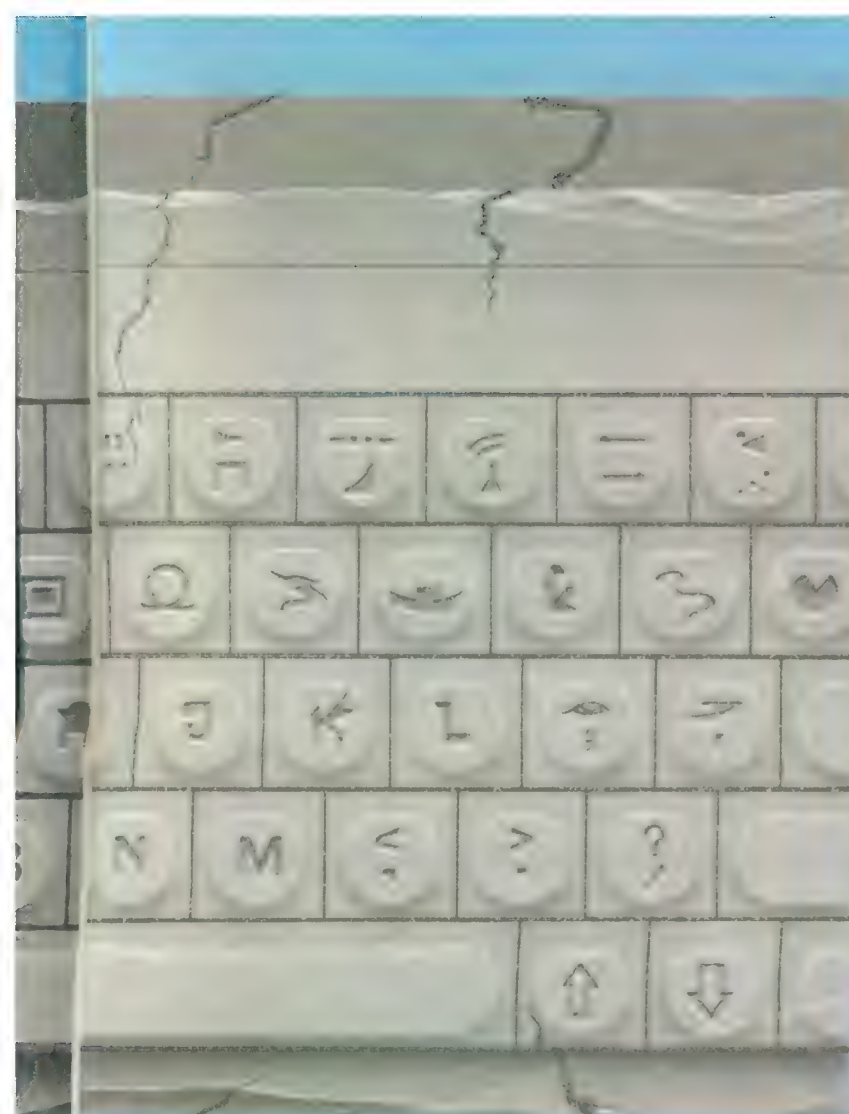
The second part of the memory store is more temporary. Information held there can be changed, moved around and over-written. Because the computer can reach for information from any part of this memory area at will it is called *random access memory*. Its flexibility is

somewhat offset by the need for a constant electrical supply to maintain the information held in it. Turn off the power to the QL and in little more than one-fiftieth of a second the RAM will be empty.

Precise

Information is held in the form of patterns of electrical signals. Each pattern represents a precise value. The ALU performs calculations on those values. On small computers like the QL and ALU cannot work directly on values stored in the memory area but only when they have been moved to a central location. Information is thus being extracted constantly from memory, taken to where it can be manipulated and then returned to the memory.

All this moving of information, along with much else, is governed by the control unit. The control unit, the ALU and the number processing area are all combined on to one chip, called the *central processing unit*.



The other two essentials of a computer are the means to acquire *input* and the means to deliver *output*, jointly called *I/O*. Information must be obtained from somewhere and, if it is to be of any use, it must eventually go somewhere. Sources of information include the keyboard and Microdrives. Destinations for information include the screen display, printers and, again, Microdrives. So far as the computer is concerned both input and output are streams of electrical signals and what their sources or destinations matter little. Qdos does the worrying for it.

CPUs are measured by the speed at which they work, the size of their processing area and the size of the portions of data on which they operate. Speed is measured in millions of operations per second or MHz. The QL CPU works at a constant speed of 7.5MHz. The controversy surrounding the other factors is better understood by examining how computers hold information.

Everything in the computer

memory is stored in patterns of electrical impulses. Circuits either hold power or they do not, i.e., they are ON or OFF. That has obvious parallels with the binary counting system where the only digits are one and zero, hence each impulse is known as a *bit* or *binary digit*. One bit can hold very little information but each extra bit added to a pattern doubles the number of variations of ons and offs which can be obtained. The QL memory is arranged to hold information in patterns of eight bits, called *bytes*.

Any value

Each byte can represent any value between zero and 255. In other words, there are 256 patterns which can be made with eight bits. Everything in the QL memory, without exception, exists as one or more bytes. Memory size is measured in thousands of bytes or *kilobytes*, often abbreviated to *KB* or just *K*. One kilobyte is more strictly defined as being 2^{10} , or

1,024 bytes — the influence of binary again — and so a 128K computer like the QL has 131,072 bytes of memory space.

The physical link between the memory chips and the CPU down which data travels is called a *data bus* and it is made of eight parallel wires along which impulses flow in both directions, one byte at a time. Having arrived inside the CPU, the bytes can be re-arranged into groups of one byte, two bytes or four bytes in temporary storage locations called *registers*. It is there that the ALU can perform arithmetic on them. The QL has 17 registers, all of which can hold up to four bytes or 32 bits. Thus the QL CPU has an *8-bit data bus* but a *32-bit internal architecture*.

Controversy

Controversy arises when the chip is described as being 8-bit or 32-bit without specifying exactly what feature of the chip that describes. Sinclair was very keen to emphasise the 32-bit properties of the chip but critics of the QL never saw beyond the 8-bit data bus. So far as the ordinary user is concerned the debate is academic, because their interest lies in how fast the computer handles useful programs.

Having stripped the computer to its essentials it is time to restore it to the state in which it can be used. The Keyboard, buzzer, Microdrives and the TV set or monitor are examples of *peripherals*, things attached to the basic computer to turn it into a usable *computer system*. Qdos calls all the major sources of information *devices*.

Another device which can be added to the QL is a disc drive which, like Microdrives, provides a semi-permanent method of storing information. If a Microdrive is like a tape recorder, a disc drive is like a record player — both store information as small magnetic fluctuations imprinted on a special surface. They are produced electrically but persist after the power source has been removed. Disc drives give much faster access to information than Microdrives and store much more information on one disc

but they cost much more than Microdrives.

One or more disc drives can be attached to the QL via a suitable *interface* which slots into the left-hand side of the computer. Many interfaces include extra chips which provide additional memory and also include ROM chips which contain new commands.

Peripherals

The QL can be connected to a television set via its aerial socket but improved quality displays can be obtained by using a monitor, a television-like device which has none of the components which allow it to receive broadcast television pictures. Connection is via a special cable in place of the co-axial aerial cable.

Other peripherals include *modems*, which allow the QL to transfer data via telephone lines to and from other computers; high-quality *keyboards*, often described as IBM-style because of the layout of their keys, and *printers*.

Printers

Printers fall into three basic categories. *Dot matrix* printers create letters from patterns of dots, are capable of producing pictures such as graphs or screen images, work very fast but sometimes lack print quality. *Daisywheel* printers produce high-quality printing from a circular printhead at a fairly slow rate and cannot produce graphics. Finally, *laser printers* are fast, versatile, high-quality and very expensive.

Having assembled the hardware of a computer system it needs to be given instructions. The easiest way to achieve it is to use programs written by somebody else, the subject of next month's instalment.

If there is any subject area or specific task you would like to see covered in a future article or articles, write and tell us. Be as specific as you can, what are you trying to achieve? What have you tried so far? Where did you come unstuck? We will investigate the most popular dilemmas

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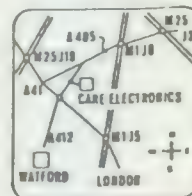
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SPEEDSCREEN ROM

SPEEDSCREEN, the fast QL display upgrade, is now available as a plug-in ROM cartridge - faster and more flexible than before. Upgrades are available for existing users.

SPEEDSCREEN makes software faster and easier to use, by replacing slow routines inside Sinclair's QL with new code that's up to 12.6 times faster displaying text, or 8.2 times faster at scrolling. Cursor and window clearing operations are also much faster. Displays look just the same, but appear much more quickly.

The **SPEEDSCREEN ROM** uses the latest fast components: a QL can read code data in our cartridge twice as quickly as code in its internal memory. The **SPEEDSCREEN ROM** is even faster than most makes of add-on memory. It's instantly available when you turn it on, and speeds up the display without using up any of your program or data memory.

Programmers: **ROM SPEEDSCREEN** supports **FOUR COLOUR FONTS** - character sets printed up to 12.6 times faster than normal, where each character can contain red, green, black and white dots anywhere on a 72 pixel grid. All versions of **SPEEDSCREEN** come with Toolkit commands, new character sets, test and design utilities, plus full documentation.

News of QUICKFAX the follow up to SPEEDSCREEN

Quickfax can be used as a stand-alone 'card file' data base, or as a 'database engine' for other programs. It is much faster, friendlier, and more reliable than Archive.

Our prototype running on a QL with CST RAM and floppy disc, can find data (eg. a surname) anywhere in an un-sorted file of 215,000 characters in less than one second. Records can be inserted or deleted instantly.

Quickfax loads a 102,400 byte file from floppy disc in eight seconds, or from microdrive in 18 seconds. Microdrive SAVE takes 20 seconds.

Quickfax copes with sorted files of up to 32,760 records. Individual items in each record can be up to 32,760 characters long.

CARD FILE

Information can be flicked through on the screen, like a box card file. Each record contains 'fields': boxes on the screen where data can be entered or edited.

you can move, add or delete boxes at any time. There's no problem if you enter a few hundred records and find you need an extra field - you just add it on.

Fields can be any rectangular shape up to 22 lines long, with 'word wrapping' at the end of each line. Only the data you enter is stored.

Quickfax is being developed and tested now. If you want to be notified in writing as soon as Quickfax is available, please send us a Stamped Addressed Envelope.

Take the brakes off your QL

so a short entry in a big box does not waste space in memory or on a file.

Helpful information, reminders, or prompts can also appear on the card in your choice of colours. You can have several card layouts for a given file, and swap between them as you work.

REPORTS

Quickfax can issue flexible printed reports to any device, with numbered pages, a choice of columns or blocks of text, and whatever fields and headings you choose. Records can be 'selected', much as in Archive, so you can limit reports to certain exceptional records.

Quickfax can sort data into ascending or descending order, based on the value of any field, or a sequence of fields. Data can be loaded into Quickfax from Archive, Quill or any text file, with no need to re-type.

PROGRAMMERS

Quickfax doesn't force you to learn a new programming language. It multi-tasks and communicate instantly with any language that supports 'pipes' - e.g. interpreted or compiled SuperBASIC, Pascal C or Assembler - so you can write programs that read, write, and compute Quickfax data, using Quickfax to keep records in order, adding whatever 'front end gloss' you want. Quickfax runs as an independant task.

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....."Does it work? My answer is a definite yes, and the proof of this is that when I do not load it and use something screen-intensive, like Quill or Editor, I wonder what on earth is wrong, as everything seems slowed down. The effects of TURBOQUILL+ and SPEEDSCREEN are additive and make Quill very acceptable in use. I think SPEEDSCREEN will be one of those programs no one will want to be without."

Review in QUANTA, January 1988.

....."The speed increase is phenomenal.... the package is well thought-out, thoroughly tested, easy to use and sensibly priced...it has the advantage of enhancing almost every piece of software available, without requiring any computer literacy from the user...SPEEDSCREEN will be very popular indeed."

Review in QL World, December 1987.

ORDERING INFORMATION

The **QL SPEEDSCREEN** package costs £30 complete, for the ROM cartridge, utility files, manual and ROM implementation notes. Please tell us whether you want the extra utility software on microdrive, 5.25 or 3.5 inch 1440 sector floppy disc.

UPGRADES from the RAM version cost £20 - please state the serial number printed on your original disk or cartridge when ordering an upgrade. You keep the RAM version: we send the ROM cartridge and extra documentation.

The RAM version of **SPEEDSCREEN** is still available, priced £20, on microdrive or disc (please specify).

All **SPEEDSCREEN** versions are available now. Prices include first class or airmail postage anywhere. **PAYMENT MUST BE IN STERLING:**

UK P.O.'s or cheques, Eurocheques or Bank Drafts. 7 day service.

THOR owners: **SPEEDSCREEN** for the **THOR** is available direct from **CST**.

The QL hates a vacuum

After negotiating the traffic to the office I open the door, switch off the alarm and switch on the coffee percolator. It is 9.10am. I think I should have stayed in bed — it was warmer and tidier.

The next task is to play back the Robin answerphone, courtesy British Telecom, and collect the messages from sometime since 9 pm the previous evening. I light my pipe continually and restore the tissues with a mug of coffee before collecting the post. The damp weather can cause problems both with the Minolta photocopier and the computer equipment. I am grateful for the storage heaters. As a precaution I switch on the electric fire.

The post consists of assorted orders, enquiries, queries on supplied programs and circulars. I power up the QL, a JS ROM

version with Trump Card and NEC drives from Miracle. I am testing the Trump Card and drives before despatching to a customer. I use a Microvitec 653 Cub colour monitor. I also have Medic (512K) and in PCML (256K) interfaces with Cumana 5.25 in disc drives to cater for all customer requirements. A Thor is also available. We insist that our programs are Thor-compatible. The Trump Card and NEC 3.5in drives suit my purposes the best.

I do not enable the Trump Card toolkit because most of the PDQL programs I use operate with Turbo Toolkit. I load Speedscreen and then run the boot file on my system disc. This was built specially by Chas Dillon; it loads Turbo Toolkit and requires me to enter the date and time. The menu is displayed from which I can select any of the Psion programs, our own PDQ-Copy or Compare or go into SuperBasic. I have Taskmaster but am not using it since I will be running only multi-taskable programs.

From SuperBasic I run *EDITOR* v. 2.05.

Before I can begin the day's correspondence the telephone — Viscount 4 — rings; I have a digital telephone with the facilities of Star services. Although there is only one line I can engage in three-way conversation or put the current caller on hold while I talk to the next caller or ask him to wait. I can also re-direct callers when I am away rather than rely on the Robin. I can store 10 of my most-used numbers and key them in with code. The re-dial button is also a time-saver.

The caller has a problem with *Archive* 2.38 which I sent to him recently. Locate appears not to work. What we need to

know is what error message he receives or what other problem he has experienced. It is also helpful to know his environment and what else is in the machine.

It appears that the version I supplied, on disc, was configured by me for data on flp2, not unreasonably. He has a single disc drive. I advise him to re-configure, using *config—bas* or our compiled and debugged version, to re-configure Archive to flp1—use for both system and data.

Cleaning again

Another call, another problem. A Trump Card purchaser cannot use the copy command from the toolkit. Have you typed in tk2—ext? I ask. He has not. All is joy and light for a few moments. He rings again to say that still copy will not work and there are problems with flp1— which is not functioning. I suggest that there are three possible solutions — the heads and the QL board need cleaning; the Trump Card should be removed carefully but replaced firmly so that all connections are made; return the equipment and we will examine it. He telephones 10 minutes later and confirms that it was the connections. With Trump Card properly in position all was well.

I usher a visitor into the computer room. Would I demonstrate *Cash Trader Upgrade*. He knows nothing about computers and is starting a new business with a new QL; he is considering a Sandy SuperQBoard. The CT demonstration is easy and impresses him. The important question is whether the system is suitable



"She's telling Ronnie how to avoid another crash."

John Silk of PDQL faces another tough day in the life of a QL user.



for him, or whether he needs the more flexible — and slightly more expensive *Trading Accounts* — the latter needing extra money. Both systems are used and welcomed by accountants, especially with *Analysier*, also requiring extra memory, which can generate any ledger account in date analysis and date order regardless of the date of input.

His business depends on nine or 10 customers with 15 products. I tell him that, apart from not being able to take advantage of *Analysier*, *Cash Trader* on his standard QL will cope with his accounting needs. He takes the four-cartridge version and leaves with the intention of acquiring extra memory.

The telephone brings a frustrated Archive user to the line. He had just added 25 records to his jazz record database when his wife switched on the vacuum cleaner. He gives his credit card details and asks how soon I can send *Recover*, and does it work? I tell him to-day and yes. The two most common reasons for suffering a lost, or rather an inaccessible dbf are failing to close the file before leaving Archive and a power surge. In any case *Recover* will recover most if not all the lost data. It is one of the two PDQL insurance programs and like all insurance most people tend to buy after rather than before a disaster.

Back-ups

The other program is *Lazarus*, dedicated to raising lost test files from a corrupted disc. It is still less painful to make a back-up and, if using discs, to use the more expensive media for everyday use.

We recommend Fuji and Maxwell branded; it is false economy to rely on the cheapest un-branded discs, whether 5.25 or 3.5in.

Programming

Generally I visit the bank and Post Office at lunch time. I can then devote the afternoon to catching up on customer problems, prepare the mailing for the evening or the following day's post and other administrative matters. I have to ensure that I have stock of all titles we sell whether PDQL built or bought from other publishers. Generally I devote one afternoon every week to the program-building task — an evening as well if a ZX Microfair of Quanta workshop looms. I talk to Helmuth Stiven of Dansoft about PDQL products for the Thor which he is handling for Scandinavia. I also have to make up the latest TK Computerware order.

The copy for the next *QL World* advertisement is due. I like to vary the copy from month to month, especially when new or revised programs are on offer. I see from WDIR that there are two advertisement files for last month and with WSTAT I see that both are about the same length. I exec *Compare* to see more easily what textual differences exist between the two files. I then read into *Editor* the corrected copy for last month and make a few changes.

The telephone rings intermittently during the afternoon, mainly for orders and enquiries. One caller, a self-confessed novice, asks how to start *Domination*, our strategy game. "I tried the usual," he says, "like *Irun* (boot). There were no

instructions." I refer him to the accompanying letter; the guide is on the cartridge as a Quill doc. I explain that *Irun—device—filename* is the command to run a SuperBasic program. You have to "execute" a compiled program, using *exec* or *exec—w*, or similar, I suggested he tries *exec—w*, or similar, I suggested he tries *exec—w udvl—domination*; and in any event reads the doc file in Quill.

I would like to enter the customer details on our name & address dbf using *Archdev*; there is no time because I expect a caller at 5pm. He had built a new program which he thinks may have commercial possibilities and requires us to handle it for him. He arrives and his SuperBasic source is loaded. I tell him that he will not get rich on a single programme at 14 percent royalties on gross sales. Before running the program I copy his files to disc. I then load the program and exec PDQ-XREF.

Impressed

This program reports the number of Toolkit and used-defined names used and gives a full glossary in alpha sequence, specifying the type of usage. The report concludes with a warnings list of names used but not apparently defined and words defined but not apparently used.

We note that *keya* is listed at line 950 as assigned a value while *key—a* is listed on lines 345, 560, and 1115 as being used but not defined. Clearly a mis-spelling has occurred which might have taken hours to discover. There are other examples of names listed as being not used. We make a note, correct the spelling where appropriate and run the program.

I am impressed, make some suggestions for improvement and decide to add it to our program list as soon as the polished and Turbo-charged version and documentation is available.

After he leaves I have one final task. I load *Spellbound* and exec *Filebound*. I must check the spelling in my article "A day in the life of . . .".

If there are any other OL users — in any capacity — who wish to trace their QL day from dawn to dusk, write to the editor for details.

Product sources

Trump Card and NEC drives, Miracle Systems.
Turbo Toolkit and Editor, Digital Precision.
Spellbound and Taskmaster, Sector Software.
ArchDEV/RTM, Archive and Quill, Psion.
Sandy SuperQBoard, Sandy (U.K.) PCP.
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QL GOLD 2

After the success of last year's QL GOLD offers, *Sinclair QL World* is continuing to support readers by offering access to special offers and cut price services to Gold Card holders.


Although we run competitions and reader offers QL Gold is a much more substantial investment in value-for-money computing.

For only £15 your QL Gold Card will bring you the free software toolkit, discounts, and special services, including cut price Microdrive Exchange programs, special subscription rates and discounts on our bargain reader offers.

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Procedurelinker

This free cartridge contains a compilation of short designer programs and procedures to aid Basic programming. The program creates selected procedures and saves the module.

Procedures include *Directory*, *Window Designer* (up to six windows can be designed on-screen), *Ink Colour* and *Paper Colour* (which scrolls the colours on screen and directs your choice to your channel automatically), *Grid* and *Grid Designer*, *Sort*, *Message*, *Mode Register* and others. There are some Turbo versions included as well as Basic, and the procedures will as far as possible work in all modes.

Incorporating these modules in your programs will save time and trouble doing programming chores, with adaptable Basic routines.

Educating Wilbur

A schoolroom nightmare — or is it the real thing? Wilbur's education is a full colour, musical arcade adventure, with our hero pursued by teachers, flying canes, the slime monster, bats, brooms and spiders as he leaps from platform to platform to collect his homework papers and get them to the headmaster's study.

Even the author has not yet played every one of the 31 screens. You can take them on for just £3.75.

Inventory

A practical Archive application which can be used to make an inventory of anything you possess, collect, and so on. Designed to provide a complete survey of your house contents for insurance, the program is easily customised for other uses by judicious pruning of the procedures. Details of this together with user instructions are contained on a Quill file.

Many procedures are standardised and may be incorporated into your own applications, for only £3.50.

Low-price Microdrive Exchange

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THE OPTIONS

Program of the Month

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This service would cost you around £35. So make sure of the best of The Progs by ordering now.

Storage Boxes

Do you keep your precious Microdrives in a cardboard box? At the bottom of an old carrier bag? On the floor? We think you really mean to treat them kindly but have not got round to it.

Don't lose your programs! Transform storage boxes hold 20 Microdrives in neat rows so that you will be able to read them in an instant. For multi-Microdrive users several boxes will slot together into a single unit.

You can buy a five box with cartridges in it for £11.50, or with 10 for £17.50.

Dust Covers

Flash our exciting *Sinclair QL World* dust cover at your friends. The covers usually cost £4.60 but we are offering them to QL Gold Card holders at the special price of £3.95.

Metalogic Datastor

The Metalogic 8000M Datastor is an ingenious credit-card-sized pocket calculator and databank with a 20-digit alphanumeric display. It can store 7,951 characters in the form of telephone numbers, names, appointments and other data. Personal information is protected by a special code.

This useful, portable electronic notebook usually costs £24.95 plus P & P. *QL World* can offer it to QL Gold card holders for the reduced price of £21.



This card entitles the signatory to the QL GOLD benefits described in the April issue of QL WORLD



QL 0976

ORDER FORM

Please send me my QL Gold card and free software. I enclose a cheque/postal order for £ made payable to Sinclair QL World Ltd.

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Please send me copies of Inventory on Microdrive, price £3.50 each inc. VAT

Please send me copies of Educating Wilbur on Microdrive, price £3.75 each inc. VAT

Please send me a Metalogic 8000M Datastor, price £21 each, inc VAT

Send your completed application, together with remittance, to: QL Gold Offer, Sinclair QL World, Greencoat House, Francis St., London SW1P 1DG.

Current members save £1.50 on renewal

Existing QL Gold cardholders can renew their QL Gold cards for the next year at a reduced rate of £13.50 instead of the new members' rate of £15. Just write to us, quoting your QL Gold card number.

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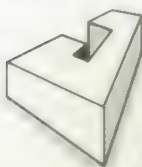


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MEETING 335
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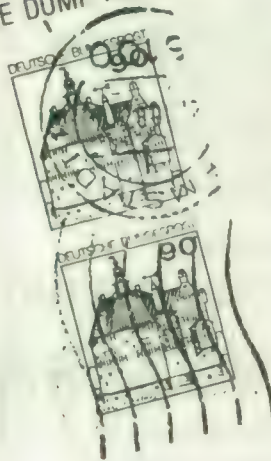
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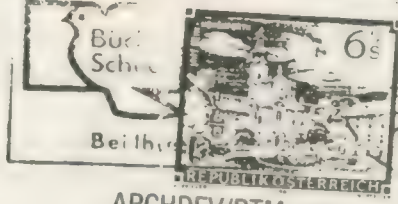


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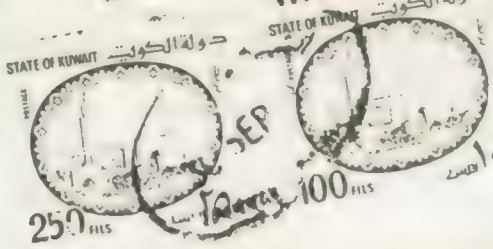
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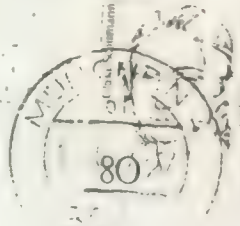


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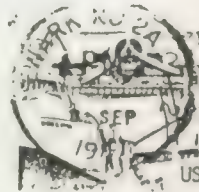
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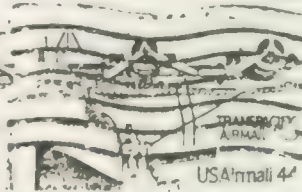
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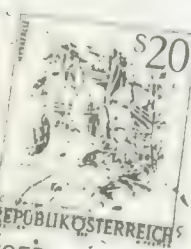
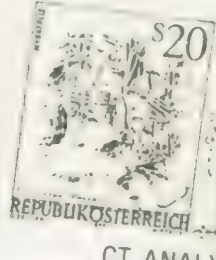
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The Cambridge Systems Technology Thor has so far been the most successful filler of the market gap for a direct upgrade for the QL. With a new, markedly different upgrade of the Thor on the horizon, Ron Massey looks again at what the Thor has to offer QL users.

THOR: nail on

The computer industry is perpetually plagued by promises of new and exciting products which, for a multitude of reasons, fail to materialise with disheartening regularity. A Sinclair-produced successor to the QL, despite the very genuine enthusiasm exhibited by its many users, proved to be no exception.

The Sandy QXT-640 was available as either a DIY conversion kit or a ready-built upgrade for a short time. The lack of an appearance of the QLT, later re-christened the Futura, has failed to fill a gap in market requirements for users wishing to move upwards from the QL.

On the other side of the same metaphorical coin, a viable successor to the ever-popular QL was almost destined to be produced. It is, after all, one of the finest micros available and the CST Thor is rapidly proving itself heir to the throne to dedicated QL users.

The upward movement of Cambridge Systems Technology from solely a manufacturer of excellent QL peripherals to the big and somewhat risky arena of computer manufacture was announced in May, 1986 with the release of the first models of its Thor PC micro.

First reported in the pages of *QL World* in July, 1986, the Thor is a direct replacement but lacking the much-maligned Microdrives for the QL. The main PCB is derived from the original QL, although there seems to be stricter quality control on shipped machines than was observed by SRL.

The CPU housing, enclosing most of the Thor electronics, consists of a steel case into which is also fitted its integral power supply, internal 640K of fast RAM and the optional disc and/or Winchester drives.

Connectors on the back panel of the Thor provide entry points for the mains input lead, a mains output connector for external peripherals, two network ports, two control ports, keyboard socket, external ROM port, system expansion port, monitor socket and a UHF modulator socket — for use with TV sets.

Optional printers may be connected to

either the parallel or one of the two serial ports and a integral standard DF-9 mouse port connector is also provided. Users wishing to add a mouse to their systems should observe the Thor requirements for a three-button mouse.

Mouse driver software is provided in ROM to allow simulation of normal key presses; with the Num Lock off, the Thor ICE system uses the number "5" key for a single click, the "0"/"INS" key for a double click and the "."/"DEL" key for a treble click. Mouse buttons are programmable to simulate any normal keyboard entry.

Keyboard

A magnificent 85-key separate keyboard, connected to the CPU unit by a coiled wander lead of more than adequate length, is included with the Thor kit and is a joy to use. Keys are positioned in three groups.

The left end of the keyboard is occupied by 10 function keys, labelled F1 to F10. The central key panel consists of 57 keys making up 48 character keys and nine control keys — ConTRoL, TAB, two Shift keys, Caps Lock, Space, Enter, ALTErnate and Delete Left, indicated on its keycap as Backspace.

The right-hand key group consists of an 18-key number pad, comprising ESCape, Number Lock and Scroll Lock — this key doubles and is the QL equivalent to <CTRL> <F5>; Break, by pressing it in conjunction with the <*SHIFT> Key); Sys Req, Thor equivalent to the QL <CTRL> <C> used for switching between tasks.

Left/Right and the Up/Down cursor keys are located on the number keys 4, 6, 9 and 2 respectively and are available for cursor movement so long as the Number Lock is off. Although no indication is given on the key caps, numbers 1, 3, 7 and 9 will move the cursor diagonally on the ICE screen.

LEDs, located above the number pad, indicate Cap Lock on, Number Lock on and Scroll Lock on. Regarding the latter LED, if you ask for a wildcard directory or any other option such as VIEW which requires

writing to the Thor main screen, a scroll lock will be generated by the system when the height of the screen is filled and will be indicated by this LED. Pressing the Scroll Lock key causes the screen to scroll up another page. Scroll Lock is also equivalent to the QL <CTRL> <F5> — Pause function.

Extension feet, located to the rear edge of the bottom of the keyboard case may be folded out to extend the rear height of the keyboard, effectively tilting it forward, facilitating greater ease of typing.

Initially, the Thor may be bought in any one of four configurations — without disc drives, for use solely as a terminal, with one or two 3-1/2in. 1MB unformatted floppy disc drives or with one 3-1/2in floppy and a 3-1/2in. 20MB Winchester. Users may at any time elect to upgrade the specification of the machine by adding additional drives.

Users are provided with SuperBasic extensions for use with machines with operating systems prior to version 4.2. One of the extensions provides KEYROW emulation, to maintain compatibility with QL software. According to the Updates-doc supplied with the Thor examined for this report, users are warned that use of KEYROW in new programs is not recommended. Users are encouraged to use INKEY\$ instead.

Other extensions available in this routine include SET-LANGUAGE for selecting the keyboard layout for the range of languages available to it and "name\$=Language\$", which returns the name of the current keyboard language.

A pleasant revelation and against all reasonable expectation, the Thor User Guide proved not to be a direct copy of the often-maligned QL manual. With a few minor exceptions the manual is presented in a clear and concise manner.

hitting the the head



The Thor: disc drives only, an upgraded quartet, and a 'magnificent' separate keyboard.

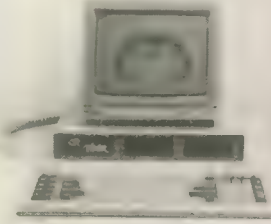
The User Guide is a single document comprising four manuals and five parts relating with the XChange program suite and deals with various aspects of using the Thor and its accompanying software.

Manual 1 describes the Thor hardware

and an enhanced Easel with an option for a 3D graph display, within the limitations of available memory. Individual copies of the programs are assigned user-defined task names.

On start-up, you are presented with the

THOR: hitting the nail on the head



and connections to the system. Manual 2 provides detailed explanations of SuperBasic and its syntax. Manual 3 is a glossary of SuperBasic keywords and provides evidence that much of Tony Tebby's Toolkit II has been incorporated into Thor SuperBasic.

XChange

From Manual 4 onwards users are given detailed instructions concerning the use of XChange and the parts following it deal with each of the components of the XChange system. Parts 2, 3, 4 and 5 are for Quill, Abacus, Easel and Archive respectively.

Part 6 is devoted to the appendix which is divided into three sub-sections, covering finer details such as Import and Export of files and matters relating to printers. Copious explanations and examples concerning language syntax have been provided in manual 2, initiating a user new to SuperBasic into the finer points of programming.

Looking through the section devoted to keywords it soon becomes obvious that SuperBasic on the Thor includes a fully-implemented version of the skeletal framework of error-trapping added to the QL JS ROM.

I feel that there are two weaknesses inherent in this otherwise very good manual. In common with the QL User Guide before it, an index of the contents has not been provided, leaving the user to search for specific information in relevant sections.

The other point which CST may care to consider for future editions of its manual is that binding paper by its edges, as opposed to stitching a book in sections, suffers from pages working loose until, ultimately, the manual consists of a collection of loose sheets.

In common with the QL, the Thor package includes the now industry-standard Psion quartet of business software XChange and is supplied as a single program package with an integral dedicated multi-tasking controller. Users may elect to switch between any number of versions of Psion Quill, Archive, Abacus

XChange Task Control screen. Superficially, its appearance is in a similar format to that adopted by Psion for each of its four business programs. Command prompts, positioned in the traditional Psion manner, appear at the top of the screen and may be toggled off and on by pressing <F2>.

While in this mode, provided data is available in two or more of the current programs running under XChange control, you have the option of transferring data from, for example, Easel to Quill. It is strange, however, that no provision has been made to exchange data selectively between two copies of Quill.

Return to specific programs is made from the XChange front-end menu with the cursor keys and by pressing <ENTER>. As with the individual Psion programs, help with the XChange commands is available by pressing <F1>.

XChange commands are accessed by pressing <F3>. Eleven command options are available to the user:

BACKUP — A file from one device to another.

CONTINUE — Continues an existing Task.

DELETE — A specified file.

LIST — Lists files on a specified device.

NEW — Creates a new Task.

OUTPUT — XChange spooler.

RENAME — Re-names a specified file.

SET — Setting the default devices for Help and Data files.

TSL — Task Sequencing Language. Produces a file of key presses.

XCHANGE — Exchange data between tasks — ie, Archive, Easel or Abacus to Quill.

QUIT — Quit XChange.

The main screen consists initially of a list of four tasks, two default devices — devices for Help and Data — and the printer status. Selecting one of the four programs listed with the cursor keys and <ENTER> you are then asked to input a Task name. Having done so, you are switched into the program selected. Return to the front-end is made by pressing <F6> where you may start another task or return to the one you just left.

While the XChange Quill is a vastly-

improved product over the original, you will welcome — or otherwise — some of the quirks to which we have all become accustomed. One of the oddities of the latest versions of QL Quill is that it is prone to dumping parts of a sentence preceding the cursor position into the following line. That anomaly appears in the display; sometimes it is self-correcting and sometimes you have to press <SHIFT> <F5> to force a screen redraw.

Other QL Quill endearments take the form of Quill seeming to lose its relationship between memory and display positions. This is most notable when the COPY command is used, although it can happen at other times, and when you try to scroll forward a paragraph at a time — pressing <SHIFT> and <DOWN>.

What seems to happen is that the cursor usually but not always remains in the same position in the display but, if you have started a following paragraph with bold, underline or sub/superscript, you can see the "TYPEFACE" prompt indicating that the memory and display positions have become dis-synchronous. Oddly enough, this happens rarely when scrolling by paragraph upwards through a document.

XChange Quill is notably faster in many of its operations, especially COPY and other block manipulations. While still inhibiting the Quill propensity to become dis-synchronous when scrolling downwards, it did not, during the preparation of this report, exhibit the QL Quill tendency to go off and do its own thing with the screen display.

One of the new Quill features which Thor owners are able to enjoy is that when updating a current document, saving while it is in the process of being edited — you do not have to hunt for the "Y" key if you wish to over-write the document on the current disc.

Screen dump

Instead, you are offered "Overwrite, yes?", requiring you only to press <ENTER> if you wish to do so. This idea is consistent with options offered by most other word processors.

Another improvement to Quill is that it now offers the option to initiate Search or Exchanges within the current document from either the current cursor position by pressing <ENTER> — or from the top of the current document — by pressing <TOP>. QL Quill always searches a document from the top downwards.

Two other improvements to the Search Exchange facility is that the time taken to search a big document has been reduced drastically and the previous search string entered is offered as the default option for the next search.

In addition to XChange the other programs included in the Thor repertoire make it into a very powerful working system. QDUMP is a very good graph



Inside: A steel chassis with optional single or dual disc drives, or Winchester drive combination.

printer driver; the keyboard utilities allow you to alter the key responses to the language you are typing.

Other routines, such as *FLP COPY* — a fast copying program; *CONVERT COPY* — for converting occurrences of mdv into flp in a file; *FILE EDITOR* and *DISC EDITOR* have been available for some time and are tried and tested utilities.

In many ways, the transition from the QL to the Thor evokes a feeling akin to *deja vu*. The similarity between the Thor and the QL is like comparing English to the American variation of the language; while not exactly identical there are enough similarities to acquire an immediate grasp of your environment.

Although most QL programs will run on the Thor it is possible some will not. One such program is the Psientific Software *Keydefine*. Other programs may suffer from the minor differences between QL and Thor screen handling. Users wishing to convert their "protected" Microdrive-based programs for use on the Thor will need to contact either the publishing house concerned or CST directly.

Light touch

Most of my criticisms of the Thor have more to do with personal working preferences than any serious grievance. The keyboard, while a superb instrument, is a little too light for my taste. Perhaps this preference owes its origin to years of

working on a manual typewriter and looking unconsciously for keyboards which need greater key pressure than the Thor requires to produce a response.

Re-setting the Thor is accomplished by pressing five keys simultaneously. While this ensures protection against accidental re-sets, the keys used require a wide finger spread.

The battery-backed clock on the Thor reviewed in this report maintained the correct year after switch off but had the disconcerting habit of re-setting the date and time whenever the machine was either switched on from cold or after every re-set.

While this was no great hardship it was slightly irritating until, after reading further into the manual, I discovered that a separate extension, SET—CLOCK, was used to transfer the time set with the SDATE command so that it would become the remembered date and time.

One of the curiosities encountered during the compilation of this report is that, if you start XChange from the ICE utility supplied with the kit and return to ICE you no longer have access to the command line in windows#0. This anomaly occurred only if XChange was started from within ICE.

On the positive side, Thor saves its screens. It is a real delight to be able to switch from XChange to SuperBasic by pressing < Sys Req > and have the original

screen still available without forcing a re-draw.

For those still hoping to XChange on their QLs, unfortunately XChange is not available and, unless one of the QL software houses is willing to inject a massive investment to the project, will never be available on the QL.

Short XChange

It is my opinion that this is a rather short-sighted marketing policy as, once users decide to move to another machine, their ultimate choice is very likely to be strongly influenced by the software to which they have grown accustomed on the machine from which they are moving. Having XChange on their current machine — i.e. a QL — is likely to ensure that they will look for a new machine which also supports XChange.

Even so, XChange is, without doubt, a tremendous improvement on the 2.3 Psion software I have been using since its release. In addition to the marginally interesting 3D graph capability of XChange Easel and the inclusion of a multi-tasking controller, the greatest Psion achievement lies in the improvements provided in XChange Quill.

I feel that, having overcome the majority of the minor shortcomings of the QL and provided a more powerful working environment, the Thor is, without reservation, a superb machine.

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2 Tick which characteristics best describe you.

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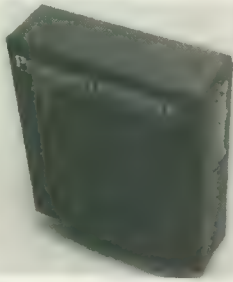
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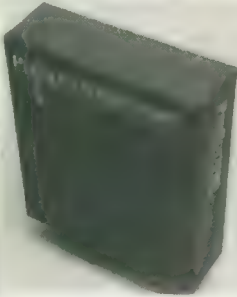
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SB

SUPER BASIC

Mike Lloyd penetrates further into the mystery of three-dimensional graphics.

A software project was introduced last month to produce a three-dimensional graph which could be used alongside and share data with the Easel graphics program bundled with each QL. The program was planned using the object-orientated design strategy. *Objects* are the result of processes carried-out in a program. Once all the objects required by a program have been identified the most important or core object should be defined before the rest of the program is tackled.

At first sight the core object of a graph program might be regarded as the data which the graph depicts but that would be misleading. The data is *input* from which the graphics co-ordinates can be calculated and it is those co-ordinates which form the true core object of the program. Other objects which must be catered for include suitable storage structures for data input and the various options the user can select when displaying the graph.

This month's article deals with taking raw data to produce graphics co-ordinates. For the moment we are not concerned with how the data is obtained or how the user can select options or with how screen dumps can be made. Because of structured programming techniques those elements can safely be left until later but before 3D graphics can be tackled the

principles behind a 3D graph must be understood.

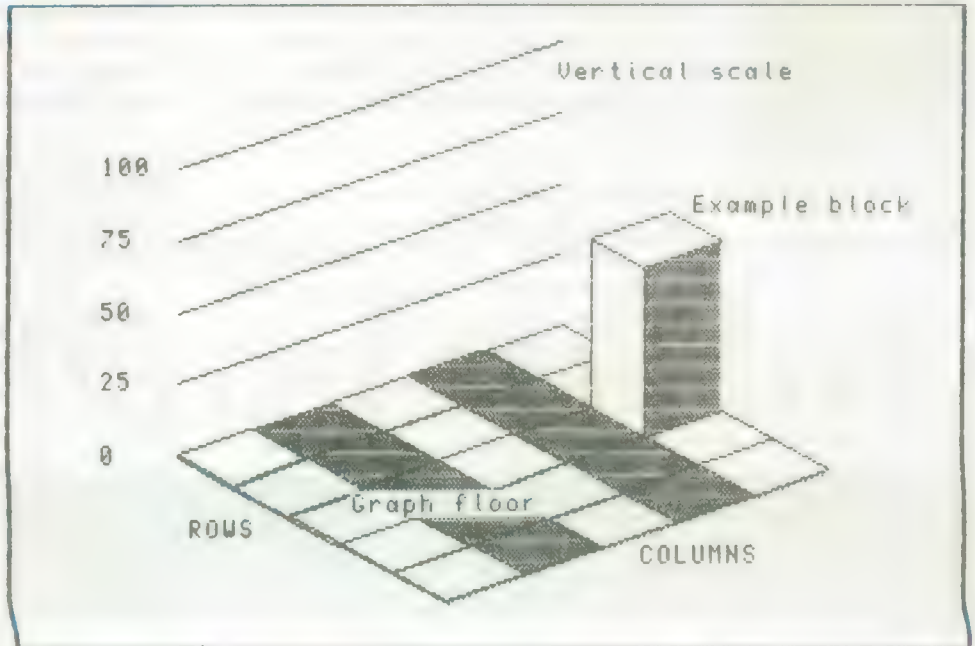
Conventional two-dimensional block graphs, otherwise called *bar charts* or *histograms*, are best at plotting a single column of data. Each of the bars of a histogram represents one value from a column of data but each bar displays two pieces of information. First, the height of each bar represents the value being plotted converted to an appropriate scale. Second, the position of each bar on the graph indicates the position of the datum it represents in the data set.

Trigonometry

The height of the blocks in a 3D graph can be calculated in the same way as for two-dimensional graphs but determining the precise

position of the block on the screen is more complicated and requires some knowledge of trigonometry. There an extra co-ordinate with which to cope, for the third dimension, but the graph has to be translated, or mapped on to a two-dimensional screen so that some form of perspective is suggested. Readers unfamiliar with sines, cosines and radians may wish to study the inset.

The basis of a 3D graph is an imaginary floor of a cube and a back wall. Unlike a conventional graph which has only two axes, the 3D graph has three axes, one for rows and one for columns and a vertical axis. Each block occupies a square on the graph floor. The floor therefore is divided according to the amount of data being presented. For a 5x7 table of data the floor would be divided into five rows



Listing 0

```
10 REMark *****
15 REMark * TEST HARNESS *
20 REMark *****
25 Cmax = 6: Rmax = 5
30 Angle = 10: Elev = 10: Cwide = 1: Shade = 0
35 DIM INFO (Rmax, Cmax)
40 DIM Rnote$ (Rmax, 10), Cnote$ (Cmax, 10)
45 Title$ = "Test data": PAPER 0
50 FOR C = 1 TO Cmax: Cnote$ (C) = "COL " & C
55 FOR R = 1 TO Rmax
60 Rnote$ (R) = "ROW " & R
65 FOR C = 1 TO Cmax
70 INFO (R, C) = C * 10 + RND (-10 TO 10)
75 END FOR C
80 END FOR R
85 Scale: Box
90 STOP
```


and seven columns. No matter how many blocks are drawn the total graph floor area remains the same.

The problems associated with positioning each graph block are best introduced by imagining how one very large block might be drawn to cover the entire graph area. One of its corners would be at the graph origin where all the axes meet. That point is located near the bottom left of the

system invented specially for this program.

For the moment, the exact units of scale used for the graph are not important. Assume that each axis is 100 units long.

One edge of the block would run along the row axis to the point (R-100 C-0 V-0); another, hidden from view, would run along the column axis to (R-0 C-100 V-0); and yet another edge would run up the vertical

Listing 3

```

100 DEFINE PFCOR circle scale
101 LOCAL x, y, r, Smax
104 WINDOW 450, 240, 70, 10: BORDER 1, 7: CLS
106 SCALE 155, -35 -angle 73, -40 Elev 12
108 Cang = RAD (70 -angle)
110 Rmax = RAD (10 +Angle +Elev)
112 Cten = 72 +Angle * C : Rten = 90 -Angle * 2
114 REMARK FIND HIGHEST DATA VALUE
116 Smax = 0
118 FOR C = 1 TO Cmax
120 FOR R = 1 TO Rmax
122 IF Smax < INFO (R, C): Smax = INFO (R, C)
124 END FOR R
126 END FOR C
128 REMARK CALCULATE SCALE MAXIMUM
130 ex = INT (LOG10 (Smax))
132 FOR n = 2, 4, 5, 8, 10
134 IF n * 10^ex >= Smax
136 Smax = n * 10^ex: EXIT n
138 END IF
140 END FOR n
142 Sstep = 4 + (n = 5 OR n = 10)
144 REMARK DRAW SCALE
146 FOR x = 0 TO Smax STEP Smax / Sstep
148 CURSOR#1, -18, x * 70 / Smax + 4, 0
150 INK 4: PRINT x: INK 2
152 POINT 0, x * 70 / Smax
154 LINE TO Cten * COS (Cang), x * 70 / Smax + Cten
      *SIN (Cang)
156 END FOR x
158 INK 7
160 END DEFINE Scalex

```

screen and can be made to coincide with the QL graphics origin by using a SCALE command such as SCALE 300,-30,-80.

Origins

By labelling the graph axes as R for row, C for column and V for vertical, the origin can be referred to as (R-0 C-0 V-0). Because the QL graphics origin has been moved to coincide with the origin of the graph the same points can also be described as (0,0) and highlighted on the screen with the command POINT 0,0. Note that the *graphics origin* is part of the QL graphics co-ordinates system but the *graph origin* belongs to a co-ordinate

axis to (R-0C-0 V-100). The remaining edges run parallel to those to form the familiar cube shape. To draw those axes a method of translating the 3D graph co-ordinates to the QL graphics co-ordinates must be developed. Drawing the vertical axis is extremely easy with the command LINE 0,0 TO 0,100.

The row and column axes are not so easy. Ever since Euclid we have been used to defining a straight line as the shortest distance between two points but this definition is not helpful in this context. Instead it is better to think of a line as having a starting point, a length and a direction which can be measured in



Circular functions

One source of confusion with computer graphics is that computers seem to associate sines and cosines with circles, whereas they were always related to triangles at school. The principles of trigonometry are perhaps simpler than school mathematics lessons make them appear.

First, some family terms associated with circles. The radius of a circle is the distance between its centre and its circumference. Its diameter is twice its radius. The circumference of a circle is slightly more than three times the length of its diameter — this ratio is more accurately 3.141593 — or pi. It follows therefore that the circumference must be slightly more than six times the length of the radius, or the radius multiplied by 2 * pi.

If a piece of string were cut equal to a radius and laid on the circumference of the circle the angle between one end of the string and the other would be one radian. It is not surprising that there are 2 * pi radians in a circle. Because of this relationship between the radius and the angles of a circle, computers prefer to work in radians.

Imagine a circle drawn on a graph so that the centre of the circle is at the origin of the graph, as in figure 1. The commands for this are:

```

100 SCALE 2,-1,-1
110 PAPER 2: INK 0
120 CIRCLE 0,0,1

```

The horizontal axis is labelled SIN short for sine, and the vertical axis is labelled COS for cosine. At the top of the circle its COS value is one and its SIN value is zero. The QL also assumes that this point is "zero radians". To prove this, type these commands:

```

130 INK 7
140 LINE 0,0 TO SIN (0),
      COS (0)

```

Run the program and a white line will link the top of the circle with the centre. By changing the values in the brackets from zero to one a new line can be drawn at about 60 degrees to the first:

```

150 LINE 0,0 TO SIN (1),
      COS (1)

```

The co-ordinates plotted can be found by:

```
PRINT SIN (1), COS (1)
```

The distance between the ends of the two lines measured along the edge of the circle is exactly equal to the radius of the circle. About 1.57 radians around the circle the SIN value reaches one and the cosine value reaches zero as the circle bisects the SIN axis. The exact point can be found by using PI/2 as the function parameters:

```
160 LINE 0,0 TO SIN (PI/2),
      COS (PI/2)
```

It should be no surprise to learn that the bottom of the circle can be linked with the command:

```
170 LINE 0,0 TO SIN (PI),
      COS (PI)
```

Here the cosine value is -1 and the sine value is back to zero, as you would expect by examining the graph. The remaining part of the SIN axis can be drawn by:

```
180 LINE 0,0 TO SIN (1.5 * PI),
      COS (1.5 * PI)
```

By moving the zero to 2 * PI in very small steps circles can be drawn with the POINT command:

```
190 FOR X = 0 TO 2 * PI
      STEP 0.02
200 POINT SIN (X), COS (X)
210 END FOR X

```

To change the size of the circle a radius length must be included in the basic formula. The accompanying listing uses OVER to create a fascinating interference pattern. Any of the values can be changed to vary the effect.

Listing 1

```

100 REMARK Demo Circle
110 SCALE 200, -100, -100
120 OVER -1
130 FOR x = 0 TO 2 * PI STEP .1
140 LINE 0,0 TO 100 *SIN (x), 100 *COS (x)
150 END FOR x

```




radians or degrees. The row axis can be said to start at the graphics origin. If it were to be 80 units long and angled two radians from the vertical it could be drawn with:

```
LINE 0,0 TO 80 * SIN (2),
80 * COS (2)
```

The command contains the three components of a line — starting point, length and direction. If its construction is not clear refer to the accompanying inset.

The front edge of the block can be drawn using a relative graphics command such as `LINE -R` to 0, 100. To complete the left face of the block the topmost point of this line must be linked to the topmost point of the vertical axis by the command.

```
LINE -R TO -80 * SIN (2),
-80 * COS (2)
```

Note that by using negative values the graphics cursor has been moved back parallel with the row axis. The initial complexities of using

sines, cosines and radians are beginning to be appreciated.

The block face parallel to the column axis can be drawn in a similar way and share two points and an edge with the left face of the block. The top of the block also shares edges with the other faces, which again eases the chore of calculating its position.

Solid faces can be drawn using the same commands but in `FILL 1` mode. The 3D effect is enhanced by giving the faces different shades. This is best done by mixing the primary block colour with a block stipple for the shaded side and a white stipple for the top of the block.

More blocks

Having drawn one large block, the calculations can be developed so that any number of blocks can be drawn. Let us start by dividing each of the block faces into two to produce four blocks. The block in the first row of the column, like the big block, will have one point resting on the graph origin. Its bottom left edge will occupy half the row axis and is drawn with the command:

```
LINE 0,0 TO 40 * SIN (2),
40 * COS (2)
```

Its direction is the same as for the row axis but it is

only half the length. The bottom left edge of the second block in the first column runs from this point to the end of the row axis and can therefore be drawn by the command:

```
LINE 40 * SIN (2), 40 *
COS (2) TO 80 * SIN (2), 80 *
COS (2)
```

The edges of the faces parallel to the column axis are calculated in a similar way. The bottom right edge of the first block in the first column is produced by:

```
LINE-R 40 * SIN (2), 40 *
COS (2) TO 40 * SIN (1), 40 *
COS (1)
```

Notice that this command draws to a point relative to the point first plotted.

It is now time to move from the specific examples to the less predictable real-life situation with which the program must cope. The only constant is that the origin of the graph is always at the QL graphics origin. All other distances, directions and values can change and must therefore be referred to with variables. The variable naming conventions are:

- Variables beginning with R refer to rows.
- Variables beginning with C refer to columns.
- Rlen is the length of the row axis.
- Rang is the direction of the row axis in radians.
- Rmax is the number of rows on the graph.
- Clen, Cang and Cmax refer to the column axis.
- Cwide is an additional variable which determines the width of blocks.

Thus the row axis can be drawn by the command:

```
LINE 0,0 TO Rlen * SIN
(Rang), Rlen * COS (Rang)
```

Two more variables, *Angle* and *Elev*, are used in the listings to represent the viewing position of the observer. Their use, along with that of *Cwide*, will be described later in the series.

The procedures *SIDE* and *TOP* — listing 5 and 6 — draw the faces of each block under the control of the procedure *BOX* — listing 4. Before they are called some preliminary calculations

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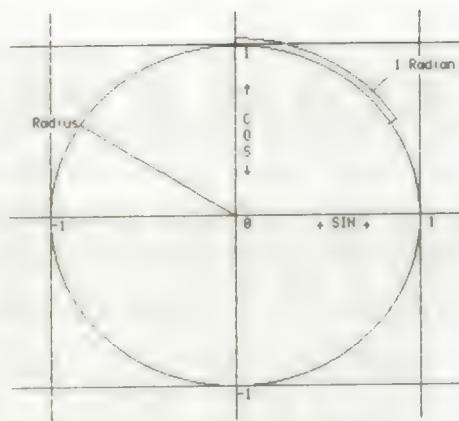
are necessary to determine where on the screen each box is drawn. *BOX* is the most important procedure in the program because it produces the *core object*, the screen co-ordinates of each block. It assumes that the data has been obtained and held in an array called *INFO* and that all the major variables have been assigned values, including the vertical scaling factor, *Smax*.

No hang-ups

One disadvantage of object-orientated design is that it can occasionally

Listing 4

```
400 DEFINE PROCEDURE BOX
402 LOCAL Cx, Cy, RX, RY, R, C, color
404 LOCAL startX, startY, edgeX, edgeY, Bxotop
406 Cx = 1 / Cmax * Clen * COS (Cang) * Cwide
408 Cy = 1 / Cmax * Clen * SIN (Cang) * Cwide
410 RX = 1 / Rmax * Rlen * COS (Rang)
412 RY = 1 / Rmax * Rlen * SIN (Rang)
414 FOR R = 1 TO Rmax
416   startX = R * RX; startY = -R * RY
418   FOR C = Cmax TO 1 STEP - 1
420     color = 3 + (C MOD 2)
422     edgeX = startX + (C - 1) * Cx / Cwide
424     edgeY = startY + (C - 1) * Cy / Cwide
426     Bxotop = INFO (R, C) * 70 / Smax
427     IF Bxotop
428       FILL 1: INK color, Shade: Side 1
430       FILL 1: INK color, 7*(Shade=0): Top
432       FILL 1: INK color: Side 2
434       FILL 0: INK Shade: Top: Side 2: INK 7
435     END IF
436     IF R = Rmax
438       CURSOR#1, edgeX, edgeY + 2, 10
440       OVER 1: PRINT Cnote$ (C): OVER 0
442     END IF
444     IF KEYROW (1) = 0: RETURN
446   END FOR C
448   CURSOR#1; startX - 3, startY + Elev / 10, -0
   *LEN (Rnote$ (R))
450 OVER 1: PRINT Rnote$ (R): OVER 0
452 END FOR R
454 AT 0, 1: PRINT Title$
456 END DEFINE BOX
```

Parts of the circle.

This points is the start point for each block and all other lines are drawn relative to it.

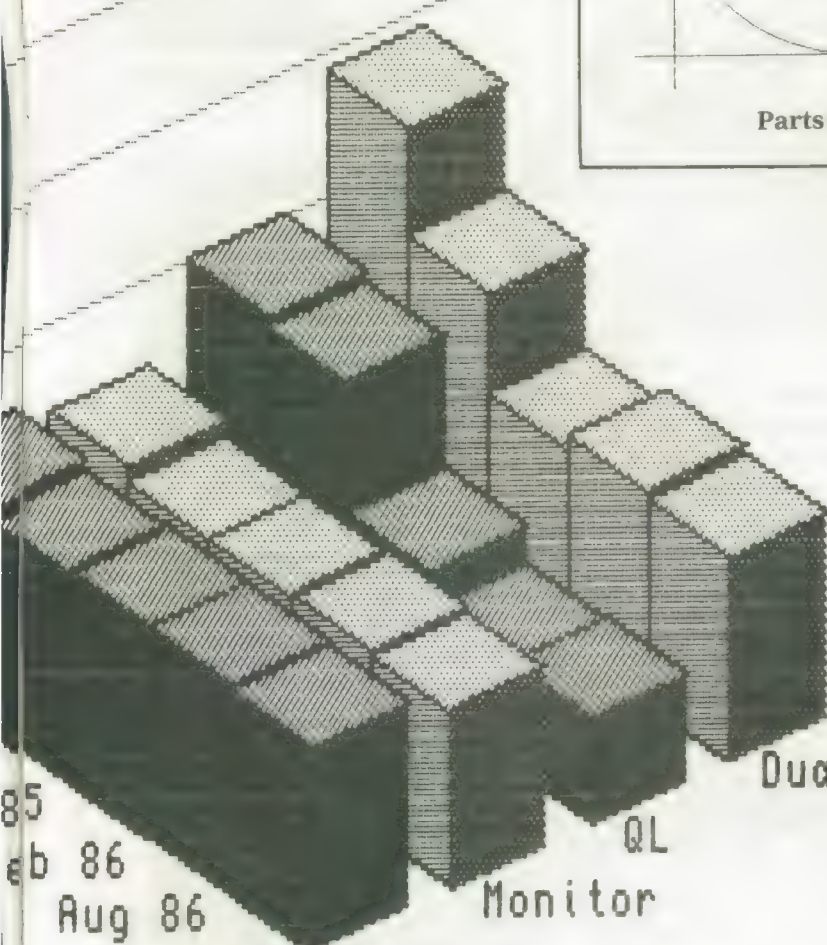
Auto Smax

Listing three calculates some of the variables used but its main function is to calculate the vertical scale of the graph. Like *Easel*, the program does this automatically. The first requirement is to find the largest value to be graphed and place it in the variable *Smax*, which unfortunately means a sometimes lengthy examination of every value in the data array *INFO*.

Smax is then rounded to a sensible value for a scale maximum. The LOG_{10} function is used to cope with any order of value for *Smax*. The intervals in the scale, *Sstep*, are also calculated, again the objective is to make the graph as readable as possible. Finally, the *Scalex* procedure uses these values to draw and label the scale on the back wall of the graph.

The remaining listing accompanying the article is a test harness which will be replaced eventually with a much more friendly control module later in the series. For now, though, it allows the other listing to be tested. You can change any of its variable values to see what effect they have.

Having produced the heart of the program, the next stage is to obtain the data from files created by the Psion *Easel* and *Abacus* packages. This awkward task is left to next month.



Dual Discs

85
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 Aug 86
 Feb 87
 QL
 Monitor
 Printer

impose a false emphasis on the production of objects. *BOX* was developed from two procedures, one which created an array of coordinates — the core object — and another which then drew the blocks. Consequently the program appeared to hang up while all the lengthy calculations were done before the first block appeared on the screen. By combining the two procedures it now appears as if the program is drawing constantly on the screen, which is far more satisfactory for the user.

Each block occupies the same floor area as its fellows, taking up $1/R_{max}$

of the row axis and $1-C_{max}$ of the column axis. The bottom left edge of the first block of the first column can be drawn by:

```
LINE 0,0 TO 1/Rmax * Rlen * SIN (Rang), 1/Rmax * Rlen * COS (Rang)
```

This formula can be seen in the assignments for the variables *R_X* and *R_Y* in listing four and similar algorithms are used to calculate the equivalent variables *C_Z* and *C_Y*. The listing uses nested loops to access each block in turn, starting with the one furthest from the viewer. Columns are coloured alternately red and green, governed by the variable

color. The variables *edge_x* and *edge_y* hold the coordinates for the bottom of the front edge of each block.

Listing 5

```
500 DEFINE PROCEDURE Side (face)
510 LINE edgeX, edgeY TO edgeX, edgeY +Boxtop
520 IF face = 1
530 LINE_R TO Cx, Cy
540 ELSE
550 LINE_R TO -RX, RY
560 END IF
570 LINE_R TO 0, -Boxtop
580 LINE TO edgeX, edgeY
590 END DEFINE Side
```

Listing 6

```
600 DEFINE PROCEDURE Top
610 POINT edgeX, edgeY +Boxtop
620 LINE_R TO -RX, RY
630 LINE_R TO Cx, Cy
640 LINE_R TO RX, -RY
650 LINE TO edgeX, edgeY +Boxtop
660 END DEFINE Top
```

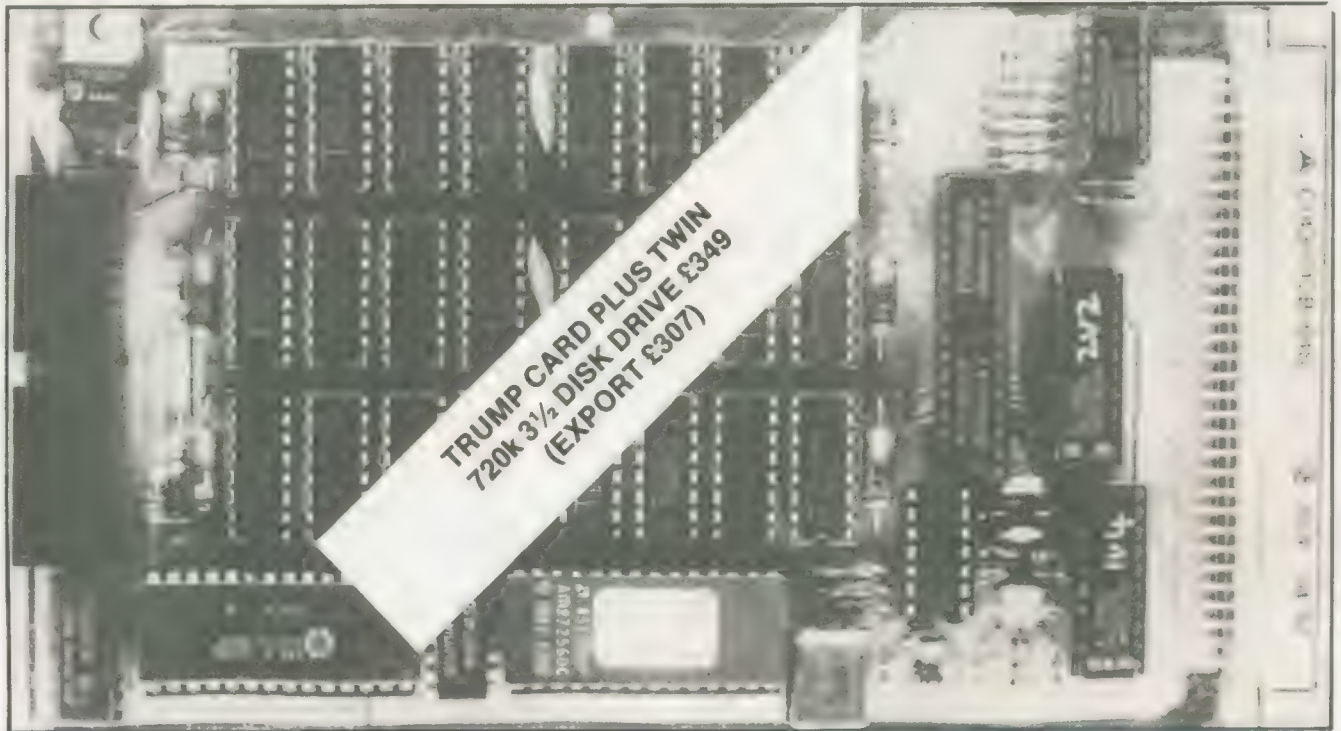



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TECHNICAL HELPLINE

Technical problems had to sink or swim when Colin Opie went to sea, but now Paul Walton roars straight out of the sun. Not so much a piece of cake as a current bun...

Beeps, protection and display wobble examined

Julian Barritt of Brighton asks how the volume of the BEEP command can be adjusted. The BEEP command is one of the wonders of SuperBasic. Nothing sums it up better than the QL User Guide when it says "the BEEP command is best used experimentally rather than syntactically." This I take to mean that it was never made to work properly either. One thing which is certain is that it offers no means of adjusting the volume. The simplest solution is perhaps to remove the cover — be careful about violating guarantee conditions — and insert a resistor in series with the loudspeaker. If you use a potentiometer — a variable resistor — and do not mind drilling holes in your QL case you can have a volume control as well.

Printer drivers

Barritt asks about configuring printers for Quill using the INSTALL—BAS program to specify 80 characters per line if printing to an OK Writer thermal printer does not have the desired effect. Instead, the lines are only 63 characters long.

The INSTALL—BAS program is used to select the printer driver to correspond to the type of printer you intend to use. It has a selection of drivers ready for immediate installation and there is one for the OK Writer with a line width of 80 characters. Your problem with the

printer sounds as if you are using a TV display, with which Quill defaults to a line width of 64 characters, the last of which is a space.

Two line widths

So why are there two line widths? The purpose of the 80-character line width in the printer driver is to ensure that whenever the printer is sent 80 characters with no carriage return, a carriage return/line feed pair is sent automatically to make sure that the printer is not trying to print beyond the width of the paper.

On the other hand, the display width set by the Design command within Quill of 64 characters is used by Quill to justify the text by inserting carriage returns after every 64 characters. Thus you will not get lines 80 characters wide on the printer because they have all been made 64 characters wide by Quill.

The simplest solution after first switching on the QL intending to run Quill is to select MONITOR by pressing F1 as the display device. This defaults to a display width of 80 characters. Alternatively, use the Design command in Quill to select the width of 80.

While on the subject of printers, S K Sen of Stevenage writes complaining of problems trying to obtain hard copy listings from the GST Macro Assembler or the Metacomco Pascal Compiler. Using his Canon PJ1080A printer, lines are being printed separated only by line feeds and with

no carriage return. Assuming that the printer has been configured correctly — check the printer manual — it would appear that the end of line character in the listings is a line feed ASC11 10. Try printing the files using the COPY — N command as:

```
COPY — Nmdv2 — filename TO ser1
```

If that does not work, the following program might:

```
10 OPEN #5, ser1
20 INPUT "Enter file name:", filename$
30 OPEN—IN #6, filename$
40 REPEAT print—line
50 INPUT #6, line$
60 PRINT#5, line$
70 IF EOF(#6) THEN EXIT print—line
80 END REPEAT print—line
90 CLOSE #5: CLOSE #6
100 STOP
```

Access code

Tony Davies of St Helens writes to ask if there is a way to protect a program such that "the only access route is via a code at the beginning of the program."

The first thing to say about software protection is that the best routines invariably inspire even better routines to overcome them.

The best for which you can hope is to make life difficult for the unauthorised user.

Protection can take two forms. It can be against the making and running of unauthorised copies or the protection of a user's own data and/or programs. Let us look at the second case where you do not want

people with access to your Microdrives to be able to run your programs without your permission. To protect a Basic program is difficult because the user can always use the COPY command to view the program. To prevent it, it is necessary to make it unreadable by the Qdos routines which handle the Microdrives. This implies producing alternative machine code routines to replace them.

So we seem to need to use a compiler or assembler. That being the case, you may as well produce the program in machine code as well. If the program is in machine code it cannot be listed to the screen or to the printer. Also it is a relatively simple matter to include a line at the beginning of the program requiring the user to enter a password.

To protect against unauthorised copying of programs is much more difficult but to explain how it is done would be helping others to defeat it.

Wobble

John Ennals of Bishops Stortford writes in response to the request in November Technical Helpline for help regarding wobbling of the top of the display:

I had the same trouble — the culprit was the PAL TV signal generator chip, labelled IC28 on the QL circuit board. Once replaced, the fault disappeared. IC28 is a Motorola MC1377P available from Adman Services, 0952 55895.

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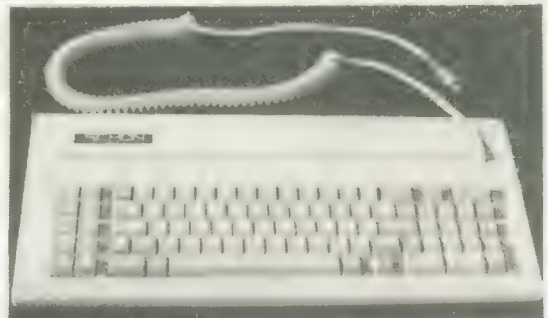


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THE

P+R=O=G<S

If you have a program that is worthy of consideration, send it to 'The Progs', Sinclair QL World, Greencoat House, Francis Street, London SW1P 1DG. We pay for everything published at the usual page rates — £80 per thousand words.

Program of the month

COMPANDER by A. QUIGLY

Compander is a machine code utility routine for the compression of graphic screens into very small files. When the code is loaded using the BOOT routine it establishes the new keywords COMPRESS and EXPAND, which are then used from within a program in the form COMPRESS 'mdv—filename' or EXPAND 'mdv—filename' to save or load a compressed screen design.

The compression routine scans the screen in single pixels — in mode 8 — in an

order which is that of a space-filling curve — 8th order Hilbert. This is done to make good use of any auto-correlation present, since successive pixels are packed together, giving a greater probability of them being the same colour. A repeat count is formed by the number of pixels of the same colour on successive pixels along the curve. This count is represented in a variable length record in the output file.

Each pixel — pair of pixels in mode 4 — is represented by a nibble for the colour and a repeat count. This count uses one nibble,

which can allow a count of 15. The count will never be 0, so the spare code can be used to indicate that the next byte is to be used as the count. This count will never be less than 16, since the extra byte would not be present in that case. The spare codes can be used with the next byte to form a three-nibble count. If three nibbles are not sufficient to represent the count — unlikely — further records are generated, as before, for the remainder.

The program is optimised for mode 8 but also gives excellent results with mode 4. In mode 4 the pixels are

taken in pairs, which can be an advantage in some cases but is usually a disadvantage although it allows the same code to be used for both modes. The screen is not degraded in any way by the compression but the size of the file generated depends on the pattern on the screen. Screens with large plain blocks are greatly compressed.

After booting from drive one type:

COMPRESS 'DEVN—FILENAME'

To expand a compressed file use:

EXPAND 'DEVN—FILENAME'

```
mdv1_COMPANDER_bas 1988 Jan 09 11:19:58 Sat
```

```

1 CLS
2 RESTORE
3 B$='0123456789ABCDEF'
4 F=RESPR(20000)
5 G=0
6 V=2//
7 REPEAT A
8 IF EOF:EXIT A
9 READ A$
10 V=V+1
11 E=HH(A$(1 TO 2))
12 D=0
13 FOR B=3 TO LEN(A$) STEP 2
14 C=HH(A$(B TO B+1))
15 D=D+C
16 POKE F+G,C:G=G+1
17 END FOR B
18 IF E<>D:PRINT'ERROR IN LINE ':V:STOP
19 END REPEAT A
20 SBYTES 'MDV1_COMPANDER_BIN',F,G

```

```

21 PRINT'DONE'
22 DEFINE FUNCTION HH(A$)
23 RETURN 16*(A$(1)INSTR B$-1)+A$(2)INSTR B$-1
24 END DEFINE
25 DATA "7D43FA000C347801104E9270004E750002"
26 DATA "43001C06455850414E4400001608434F4D"
27 DATA "1B505245535300000000000000061064E75"
28 DATA "1261544E75610000940C80000000006702"
29 DATA "004E7572FF478341FA033E70014E420C80"
30 DATA "180000000067024E75227C00020000263C"
31 DATA "6000001FFF429951CBFFFC428342854286"
32 DATA "A324463F3C00013F3C00086100007E588F"
33 DATA "8F70024E424E7561420C80000000006702"
34 DATA "644E7572FF760241FA02EE70014E420C80"
35 DATA "FE0000000067024E754283428542862446"
36 DATA "D7264A3F3C00013F3C0008610000B26100"
37 DATA "3101FA588F70024E424E75226E00583478"
38 DATA "5A01164E920C430001670470F14E753036"
39 DATA "03980041FA02A230C05489538010F69800"
40 DATA "E2528951C8FFF842804E753E2F00040C47"
41 DATA "E300006768382F0006D60444453473F04"
42 DATA "2F3F076100FFE6588F610000C8382F0006"

```



```

43 DATA "C23E2F0004960453473F043F076100FFCC"
44 DATA "08588F610000AE382F00063E2F00045347"
45 DATA "FE3F043F076100FFB4588F382F00063E2F"
46 DATA "6C000496046100008E2444453473F043F07"
47 DATA "386100FF98588F382F0006D6044E753E2F"
48 DATA "8300040C4700006768382F0006D6044444"
49 DATA "0F53473F043F076100FFE6588F610000D6"
50 DATA "81382F00063E2F0004960453473F043F07"
51 DATA "586100FFCC588F610000BC382F00063E2F"
52 DATA "F9000453473F043F076100FFB4588F382F"
53 DATA "6E00063E2F000496046100009A44445347"
54 DATA "113F043F076100FF98588F382F0006D604"
55 DATA "CC4E75B4FC0000663C2F034281363CFFFF"
56 DATA "F870014E4336410C01000F6306E8093441"
57 DATA "5E602070014E430C01000F630434416012"
58 DATA "F7CF8A3E01E14F70014E431E0106470100"
59 DATA "07CF8A261F340B534A20052206227C0002"
60 DATA "5C0000EF81D3C122000281000000030280"
61 DATA "99000000FCE280E3C02002D281ED080282"
62 DATA "800000000CE90AE228E22A851981116100"

```

```

63 DATA "FE00F64E7520052206227C00020000EF81"
64 DATA "CED3C122000281000000030280000000FC"
65 DATA "2CE280D3COD28114191011E32AE3280202"
66 DATA "C700C0020000C0E4088400E80A0242000F"
67 DATA "74B44B6604528A600C610000103642247C"
68 DATA "B200000001610000A04E75B5FC00000000"
69 DATA "866F0000922F033638FFFFB5FC00000010"
70 DATA "576C16C18AE988C18AD7CA220B70054E43"
71 DATA "68247C0000000006060B5FC000001006C14"
72 DATA "59320B70054E43320A70054E43247C0000"
73 DATA "0D00006044320B70054E4395FC00000100"
74 DATA "97B5FC00000FFF6F18123C000F70054E43"
75 DATA "48123C00FF70054E4395FC00000FFF6018"
76 DATA "A8320AE0490201000F70054E43320A7005"
77 DATA "724E43247C00000000B5FC000000006E00"
78 DATA "E8FF7A261F4E75020300030C0300006604"
79 DATA "56520560200C0300016604520660160C03"
80 DATA "63000266045305600C0C03000366065306"
81 DATA "59600000024E75"

```

```

XSDRCSDEE=RESPR(1024)
LBYTES 'MDV1_COMPANDER_BIN',XSDRCSDEE
CALL XSDRCSDEE

```

UPDATE: Two data lines dropped off last month's Program of the Month, Radar. They are:

```

2510 DATA 'The default can be moved by pressing > or ?'
2520 DATA 'Alternatively you can press keys 1 to 9'

```

MENU by P. McMAHON

Menu is a general-purpose FuNction routine to produce a menu block at the top of the screen which allows a user to step through a program under menu control.

Two parameters are required when the FuNction is called, an array of menu options and the number of options. An option is selected either by scanning through the

options using the left and right arrow keys or the TAB and shift-TAB key and then hitting enter when the desired option is highlighted or by pressing the key equivalent to the first letter of the option required.

It is not necessary to wait for the entire menu to be written, as the keyboard is scanned as each menu option is printed. The only criterion therefore when using this procedure is that all the options should start

with a different letter. The option is also provided to allow the user to press the 'esc' key and return the user to a previous menu. This option is sensed by returning a value 0 and also setting a global variable esc — flag equal to 1.

The function is used as follows:

```

1000 optn = menu(choic$,12)
then
1010 SElect on optn

```

1020 =65:REMark 'a' key pressed
... carry out the following...

1030 =72:REMark 'h' key pressed

1040 =0:REMark 'esc' key pressed

The example in the listing uses the menu from Quill. The routine is written for use in mode 4 but could be easily adapted for mode 8.

```

100 DIM x$(15,15)
110 CLS #1:CLS #2:CLS #0
120 DATA "Erase","Header","Margins","Save","Copy",
"Footer","Justify"
130 DATA "Print","Tabs","Design","Goto","Load","Qu
it","Other"
140 RESTORE 120
150 FOR i=1 TO 14:READ x$(i)
160 option=menu(x$,13)
170 PRINT#0, option
180 GO TO 140
6000 DEFine FuNction menu(array_option$,options)
6010 LOCAL loop,key,first_let$(options),newrow,lx(
options),temp,temp$
6020 esc_flag=CODE(INKEY$(0)):esc_flag=0
6030 OPEN #9,scr_502:22a5x0:BORDER #9,1,6:PAPER #9
,0:CLS #9:lx(1)=11
6040 INK #9,6:PRINT #9,"COMMANDS: ";:INK #9,4
6050 FOR loop=1 TO options: first_let$=first_let$&
array_option$(loop,1)
6060 FOR loop=1 TO options
6070 temp$=INKEY$(0):IF CODE(temp$)<>0 THEN :IF
temp$ INSTR first_let$ THEN CLS #9:CLOSE #9:RETURN
CODE(first_let$(temp$ INSTR first_let$))
6080 IF loop>1 THEN lx(loop)=lx(loop-1)+LEN(arr
ay_option$(loop-1))+2
6090 IF lx(loop)+LEN(array_option$(loop))>=82 TH
EN AT #9,1,0:lx(loop)=0:newrow=loop
6100 PRINT #9, array_option$(loop); " ";

```

```

6110 END FOR loop
6120 loop=1:AT #9,0,11:INK #9,6:PRINT #9,array_opt
ion$(1)
6130 REPEAT menu_sel
6140 key=CODE(INKEY$(-1))
6150 SElect key
6160 =200,9:temp=loop:loop=loop+1:IF loop>optio
ns THEN loop=1
6170 AT #9,1*(temp)=newrow,1x(temp):INK #9,
4:PRINT #9,array_option$(temp)
6180 AT #9,1*(loop)=newrow,1x(loop):INK #9,
6:PRINT #9,array_option$(loop)
6190 =192,253:temp=loop:loop=loop-1:IF loop<1 T
HEN loop=options
6200 AT #9,1*(temp)=newrow,1x(temp):INK #9,
4:PRINT #9,array_option$(temp)
6210 AT #9,1*(loop)=newrow,1x(loop):INK #9,
6:PRINT #9,array_option$(loop)
6220 =10:CLS#9:CLOSE#9:RETURN CODE(first_let$(1
oop)):REMark return key
6230 =27:esc_flag=1:CLS #9:CLOSE #9:RETURN 0:RE
Mark esc key
6240 =32 TO 127:IF CHR$(key) INSTR first_let$ T
HEN CLS #9:CLOSE #9:RETURN CODE(first_let$(CHR$(ke
y) INSTR first_let$)):ELSE BEEP 5000,45
6250 =REMAINDER :BEEP 5000,45
6260 END SElect
6270 END REPEAT menu_sel
6280 END DEFine menu

```


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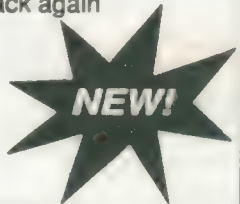
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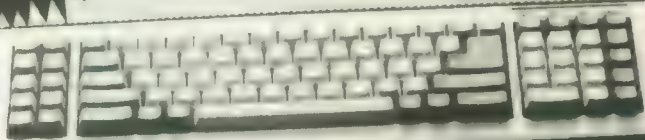


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PORTER A REGULAR -ER VERB			
present	imperative	future	perfect
je porte tu portes il porte nous portons vous portez ils portent	porte! portons! portez!	je porterai tu porteras il portera nous porterons vous porterez ils porteront	j'ai porté tu as porté il a porté nous avons porté vous avez porté ils ont porté
imperfect	conditional	pluperfect	past historic
je portais tu portais il portait nous portions vous portiez ils portaient	je porterais tu porterais il porterait nous porterions vous porteriez ils porteraient	j'avais porté tu avais porté il avait porté nous avions porté vous aviez porté ils avaient porté	je portais tu portais il portait nous portions vous portiez ils portaient

Answer: Linked ENTERable: ESIDE **
 The program: Test: to select: none: action:
 ESC: clear: F1: restore: ESC: swap: ...

Menu: Question No. 1 4
 Mode: Insert F3: ... ESC: ...

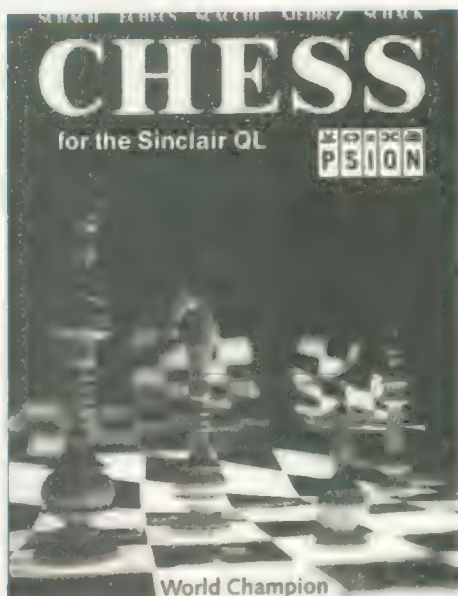
Which is a line joining areas of equal rainfall over a period

- F1 isohyet
- F2 isobar
- F3 isoneph
- F4 isobath

They are all lines joining places with an equal value of some element

isohyet = rainfall
 isobar = pressure
 isoneph = average cloudiness
 isobath = points on the sea bed with equal depth

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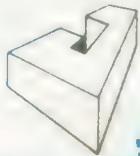
Complete with full instructions, easy to fit, this little chip gets rid of the annoyance caused by "roll over effect" which means that when you accidentally touch an adjacent key, your target letter prints twice. If you have found this a problem in the past, then the keyboard controller chip is just what you need.

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The 8000 also comes in credit card size, which slips into your wallet, and has the same functions as the desktop version.

If you can't make your mind up between the two, why not have **BOTH** and take advantage of the **FREE CABLE** (normally £9.95) which **LINKS** the two and allows you to copy data from one to the other!

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ICE

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ICE is a ROM based utility program that turns your QL into an ICON controlled "state of the art" computer. Not only does it add a number of functions not found on a standard QL including calculator and calendar, it also makes all basic functions a dream to use.

ICE + MOUSE

The Eidersoft mouse combined with the above ICE rom gives your QL the power of the Apple Macintosh or GEM. Mouse control is implemented on all packages that use the ICE system, which gives a very smooth and fast response that will not be outrun. If you already have ICE we offer a £10.00 trade in if you return your existing ICE.

ARTICE + MOUSEART

A keyboard or mouse controlled graphics program. The features include circle, line, box, free hand draw, paintbox colours and brushes, copy transfer and save image. Epson printer dump, undo, spray can, recolour, text, mode 4 and 8 operation.

ICICLE

A multi-tasking utility that allows you to set up your own ICONS for the control of programs, including QUILL, ABACUS and a host of other programs. As well as a full ICON editor it includes a printer spooler and printer manager.

DRAWING OFF-ICE

3D screen designer aimed at producing true 3D images on your screen. The perspective is automatically calculated to a given vanishing point. This is not some complex co-ordinated program which requires you to work out every point of the 3D object in advance. Requires 3 1/2" disk drive. This program now includes an enhanced version of mouse arts. Expanded memory required.

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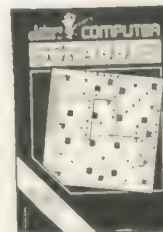
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Is the excellent sequel to QL caverns incorporating many of the excellent features and graphics of the original game.

BJ IN 3D LAND

BJ is lost again! This time in a 3D maze that will pose a challenge to all (70 screens).

KARATE

Incredible graphics, 18 different movements including kicks, punches and somersaults. Multi screen action, large flicker, free sprites, multi player option sound effects, keyboard or joystick control.

SPOOK

Probably one of the best versions of Pacman for any Micro computer.

GAME PACK

Comprising of ZAPPER, the classic arcade game Eagle, a defender type game and Citadel where you must unravel the secrets of a giant city as you steer your craft through 50 screens of danger and excitement and, finally, BJ returns.

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Q KICK

Multi-tasking utility program including DESK, CLOCK, FILES, NOTES and TOOLS, similar to SIDE KICK on PC available only on disk.

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GRAPHICS CONSTRUCTION KIT

A set of utilities that allow you to construct your own pulldown menus in SUPER BASIC.

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Q WRITER

A marvellous utility for anybody who wants something different from their printer. Includes 29 different character sets of Epson compatible printers.

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Q-SWITCH

Multi-tasking that permits a quick switch from ARCHIVE to ABACUS, QUILL or EASEL, suspending tasks while jumping to another task. Written by the author of ICICLE and KEYDEFINE this is a very popular package.

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QSPELL

A spelling checker for Quill, supplied with a dictionary of 25000 words and checks an A4 page in 24 secs.

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Q-FLASH RAM DISK

Allows the user to define ram disk programs can then be instantly saved and reloaded. A print spooler is also included to allow you print whilst using other programs.

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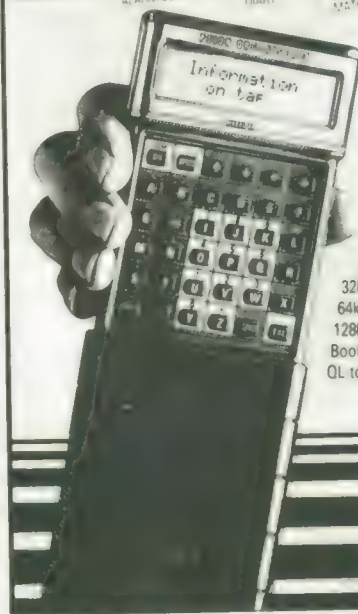
ITEM: TRU-FOR
RNDHT: 5.28

24:TUE:12.38
ALARM

24:TUE:11.38
XE at Psion

65sin(p1/4)
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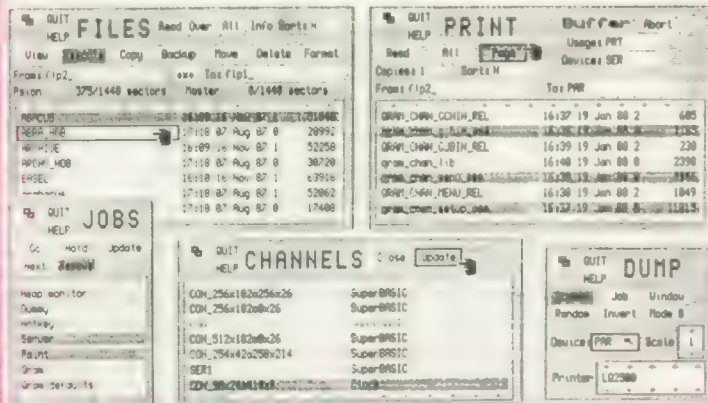


The QJUMP Pointer Interface software is the core of our development plans for the QL. This is the new environments. It gives you mouse, cursor key or single keystroke control of your QL. Only QJUMP brings you a

work with it, the best of the new software coming will not work without it. Three other QL software suppliers have already adopted it.

QGRAM is the basis for any QL Pointer Interface system.

QGRAM is the RAM based utilities package designed to get the best out of any QL with RAM expansion. QGRAM has a range of facilities unparalleled by any other QL front end or control system. The QGRAM menus pop up at the touch of a key to provide instant access control of your QL's FILES, PRINTER, JOBS and CHANNELS, and instant screen dumps to a wide variety of printers.



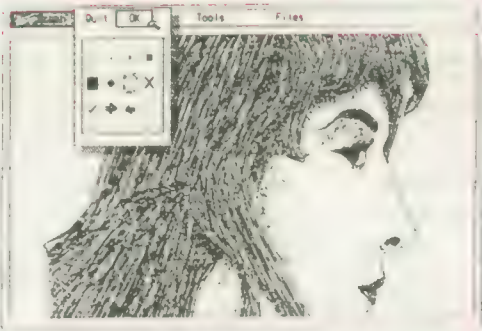
QTYP is the typing checker for the QL

QTYP can check as you type, or you can run your (almost!) finished document through it as a final check. Pop-up windows advise you of unknown words, suggest correct spellings given partial words, and warn you about difficult words (do they get easier with practise or practice?). You can even use QTYP's dictionary from within your own programs. QTYP has a 45,000 word English dictionary, which you can extend or edit. Deutsch version is now available.



QPTR is the ultimate QL windowing toolkit.

QPTR gives programmers the chance to use the QJUMP Pointer Environment, a set of utilities and extensions to the QL's screen driver, that provides pointer input, non-destructive windows, graphics objects and menu support. A 150-page manual documents how to use all these facilities, from both SuperBASIC and machine code programs. Four demonstration programs are provided, giving examples to study and modify. One is written in both SuperBASIC and assembler (source supplied), showing how a program may be "hand compiled" once you have it working in SuperBASIC. There is a Paint program, written in SuperBASIC so you can add to it yourself; for a program written to test the Pointer Toolkit, we think it compares rather well with some of the other painting programs available! You don't need a mouse to use QPTR, menus can be used with the cursor keys or by single keystrokes, but you can add QIMI to your system at any time without having to alter any of your software. SuperBASIC programs using QPTR may be compiled using Q_Liberator.



QIMI

QIMI is the Internal Mouse Interface from QJUMP. The QJUMP Pointer Interface automatically detects the Internal Mouse Interface so no changes are needed for any programs which use the QJUMP Pointer Interface. QIMI is the only mouse interface which leaves all of the QL's expansion facilities free for other peripherals. QIMI fits right inside the QL and is supplied with tools. QIMI works with ATARI compatible mice, which we can supply.

+RTC is now available for keep the QL's Real Time Clock running when your QL is turned off. Not just the simple battery as supplied by others: that was too unreliable for Sinclair to give away! +RTC incorporates a turn-on glitch suppression circuit which has been shown to improve the reliability of "bad" clocks by more than 50 times. Only available with QIMI or as an upgrade to QIMI.

Other QJUMP Products

QTK II is the SuperToolkit II. The "clear market leader" (QL World) in Toolkit ROMs. Why buy separate keydefine programs, Job control utilities, default directory utilities etc. when QTK II has them all and more? "Jedem ernsthaften QL-Anwender zu empfehlen" (Computer Kontakt).

QHON II is the QL Monitor/Debugger with single line assembler/disassembler, normal as well as conditional breakpoints, trace and backtrace, search, macro commands, transient windows and full window memory editor and much much more. "Das absolute Spitzenprodukt" (68000er), can we say more?

QEP III is the "Rolls Royce" (Sinclair User) of EPROM programmers; "the finest EPROM programmer I have used" (Sinclair QL World) and many QLs have been bought just to use QEP III. Programs EPROMs 2716 to 27512, NMOS or CHOS. Features high and low voltage verification. Too many facilities to describe here, it puts £1000 EPROM programmers to shame.

QFLP disk driver upgrade ROMs are available for Medic System cartridges (gets round many of the faults on some of the early Medic disk drives) and MicroPeripherals, version 3 or version 5 (provides compatibility with the rest of the QL world, improves performance and adds many Toolkit commands).

QGRAM	available on Mdv / 3.5 / 5.25	£29.90 (£26.00 export)	
QTYP	available on Mdv / 3.5 / 5.25	£29.90 (£26.00 export)	
QPTR	available on Mdv / 3.5 / 5.25	£29.90 (£26.00 export)	
QTK II	available on ROM / Mdv / 3.5 / 5.25	£29.90 (£26.00 export)	
QHON II	available on Mdv / 3.5 / 5.25	£19.95 (£17.35 export)	
QFLP	for Medic, MP ver3 and ver5	£14.95 (£13.00 export)	
QEP III		£129.95 (£113.00 export)	
QIMI	£29.90 (£26.00 export)	+RTC	£39.90 (£34.70 export)
QIMI+mouse	£69.90 (£60.80 export)	+RTC	£79.90 (£69.50 export)
QGRAM+QIMI	£54.90 (£47.76 export)	+RTC	£64.90 (£56.50 export)
QGRAM+QIMI+mouse	£89.90 (£78.00 export)	+RTC	£99.90 (£86.85 export)
RTC upgrade for QIMI (exchange)			£19.95 (£17.35 export)

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MICRO DRIVE

THE PROGRAMS

1. Giles Todd B DIY Assembler £5

Featured in the March to June 1985 issues of *QL User*, this complete two-pass assembler will assemble all 68008 code and support the assembler directives DRG, END, EQU, DC and DS.

2. Richard A + O Mini Monitor Cross £3

Using approximately 3K of RAM, this utility multi-tasks on your QL, leaving plenty of room for other programs. Commands include dumping registers, memory and ASCII machine code (race, register store, memory move, memory store — byte, word and long — and jumps. *QL User*, October 1985.

4. Shergold & B Golf Tose £2

With up to 50 courses of varying difficulty, lakes, rivers, bunkers and trees. You decide the power and direction of each stroke, striving for a birdie, eagle or even an albatross. Your scorecard may be saved. *QL User*, May 1985.

5. Williams A + O Paladin & Holliday £5

Written completely in machine code, this excellent *Space Invaders* game was the basis of our games programming series, started in April 1985.

7. Steve Deary B Pacman £1

Almost 20 screens of increasing difficulty, including an invisible maze, make it a very versatile rendition of the arcade favourite. *QL User*, March 1985.

8. Andy B Family Tree Carmichael £3

An Archive program and database for setting-up and displaying large family trees. *QL User*, August 1985.

9. James Lucy L Composer £3

Completed in *QL User*, October 1985, this QLiberated program will allow you to compose, play and edit music. The program will handle sharps, vary tempo, and specify staccato and legato playing styles.

13. S J Ackers S Touch Type £4

This program has a 13-lesson course for typing letters, words and phrases, a 700-word vocabulary, an interactive keyboard display and a lingering chart as more than 30K of code. Scores are based on the speed and accuracy of typing. A reduced version was printed in the August 1985 issue.

17. Tony Quinn S CAD QL £4

CAD design programs are particularly suited to the QL. This version includes rubber-banding and a user-definable symbol library. *QL World*, September 1988.

19. Karl Jeffrey M + B Starport 2001 £3

Fast machine code action in this version of the *Galaxians* arcade game. *QL World*, November 1986.

24. J F Tydeman S Design 3D £4

3D screen designs with the minimum of fuss and aggravation. *QL World*, March/April 1987.

25. D Carmona B Stellaris £4

This is an extensive real-time space adventure game against the computer, including economic simulations, lunar landing and superb graphics. *QL World*, June 1987.

29. Peter B Bridge Etheridge £4

An excellent version of this popular card game. Features include accurate computer bidding, automatic or manual play, replay hands, correct scoring, save and load positions and more.

31. B Otridge Crossword £5

Originally a commercial program, this is the perfect aid for crossword fanatics: access by word length to a dictionary of about 12,500 words, to help solve those elusive clues. This program requires two Microdrive cartridges.

32. Phillip B Advent2 Sproston £4

SuperBasic arcade adventure with a humorous slant. A variety of rooms, robots and problems will keep you on your toes. Full instructions included.

33. Leslie B Clock Fahidy £3

This is a complete version of the clock program, described in the June and July 1987 issues of our QL Education series. An on-screen clock can be used to set or read the time.

34. E Bamber QL Conversion/ Calculator £2

Weights and measures units, conventions and reverse Polish calculation, this utility will convert almost anything to anything. Completely menu-driven, it is very easy to use.

35. John B Qwhist Wakefield £3

Designed for one player (south) who partners a computer hand (north) against the computerised east and west opponents. *QL World*, August 1987.

36. Stanley B Mail Merge Sykes £1

This cartridge contains very handy utilities providing a mail merge and labeller for Quill files. Includes a demonstration.

EXCHANGE

READY
TO RUN
SOFTWARE

KEY B = SuperBasic
A + O = Assembler and Object Code
M + B = machine code and Basic Loader

A + B + O = Assembler and Basic Loader and Object Code
S = Supercharged
L = QLiberate

37. P G Ives B The Double £4

A large strategy game in which you manage a football team through four league divisions; features buying and selling, team line-up, morale, and so on, through the league and F.A. Cup season. Includes full instructions.

38. Leslie B Education £2
Fahidy

As part of our series of educational programs, this is designed to help teach the solution of simple linear equations. It is aimed specifically at the 11-plus age range.

39. J F S Design 3D £4
Tydeman

A large suite of graphics and filing utilities for the production of 2D and 3D graphics, with instructions in the form of a Quill document. *QL World*, March 1987.

40. Santiago B Roulette £3
Rubio

A Spanish/English version of the traditional gambling game; includes the Leigh Pattern, a system to break the bank. *QL World*, September 1987.

41. Leslie B Money £2
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An educational shopping expedition, calculating prices from shopping lists and trying to determine what coins you will receive as change.

42. Neil A + B + O Life £2
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A machine code version of the classic simulation of a colony of living cells which survive, reproduce or die according to mathematical rules. Quill instructions included.

43. Alan S Ian Swinton
Glassbrook Qsquidge £2

An arcade hunt through an 8x8 grid expandable series of rooms for the nine parts of Squidge's rocket. *QL World*, October 1987.

44. David March B Compress £2

Utility to compress SuperBasic program files into a more compact form without losing the structure of the program.

45. Ronnie M + B SuperBreakout £2
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A fast machine code version of the classic wall game where, using a bat and ball, you must try to break through the wall of bricks. Optional double bats and/or balls.

46. Norman B Navigator £2
Marks

To calculate the distance and direction for travel between longitude and latitude positions on the Earth. The program includes an expandable list of locations. The calculation formulae can be seen from within the program.

47. Richard B 3D Maze £2
Clements

Chase round the generated maze, shown in three dimensions, searching for the key to the next level before going through the exit. Extra points can be gained by passing over Point Squares but do not be carried away because it is all against the clock.

48. Jason B Yahtzee £2
Price

The popular dice game. On-screen graphics make the two-player program enjoyable and easy to use. *QL World*, November 1987.

50 Jay B Bank £4
Lewington

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